

Landpower TDI

TURBO DIESEL INTERCOOLER

125 TDI

135 TDI

145 TDI

165 TDI

185 TDI

Landpower TDI

Operation and maintenance manual

Valid for the following tractor models:

For tractors with cab or platform model:

Landpower TDI
Turbo Diesel
Intercooler
125TDI-135TDI-145TDI
165TDI-185TDI
Top-Tronic
Top
Techno

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LANDPOWER TECHNO TDI
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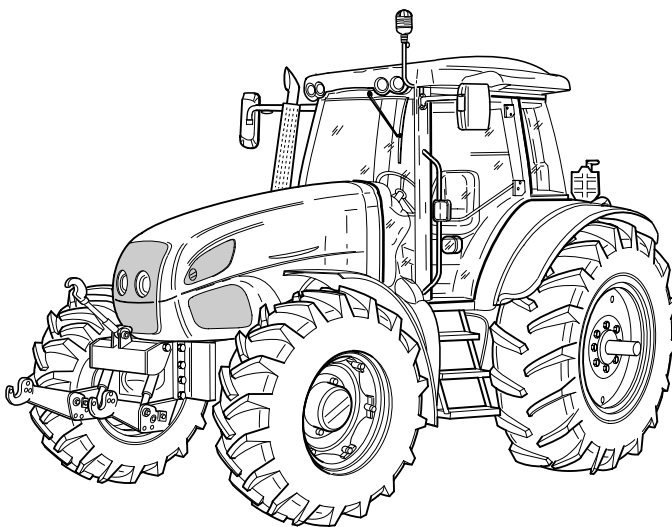
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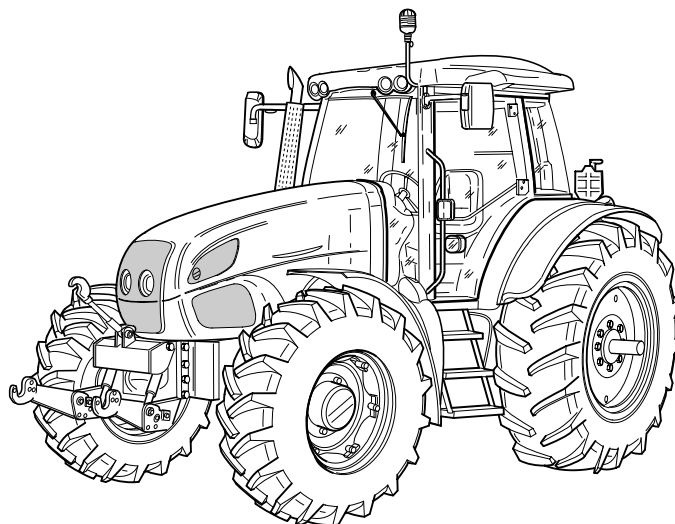
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Landpower TDI
Turbo Diesel
Intercooler
125TDI-135TDI-145TDI
165TDI-185TDI
Top-Tronic
Top
Techno



***WARNING:** If the tractor is fitted with a cab that is not approved by the tractor's maker, the warranty concerning the modified functional units becomes null and void (safety frame, electric and hydraulic systems, etc.). Further, it is not possible to check for compliance with noise level standards and with technical approvals.*

CALIFORNIA
Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

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Tractor identification

Tractor identification

Your tractor is identified by a plate (Fig. 1-1) and by a serial number stamped on the radiator support. The engine serial number is stamped on the engine block.

Always state the chassis and engine serial numbers to ensure prompt and efficient service when ordering spare parts or when asking for technical explanations or other information.

NOTE: Look after this Operation and Maintenance Manual carefully and consult it whenever in doubt.

This publication has been written in compliance with International Standard ISO 3600 'Guide for: Information, contents and presentation of operation and maintenance manuals supplied with tractors and machinery for agricultural and forestal use'.

Chassis serial number (2)-(3)

Engine serial number (4 - at left)

Cab serial number (1)

Owner / Operator

Address of dealer

.....

Delivery date

Warranty expiry date

Manufacturer's plate and type of tractor (2)

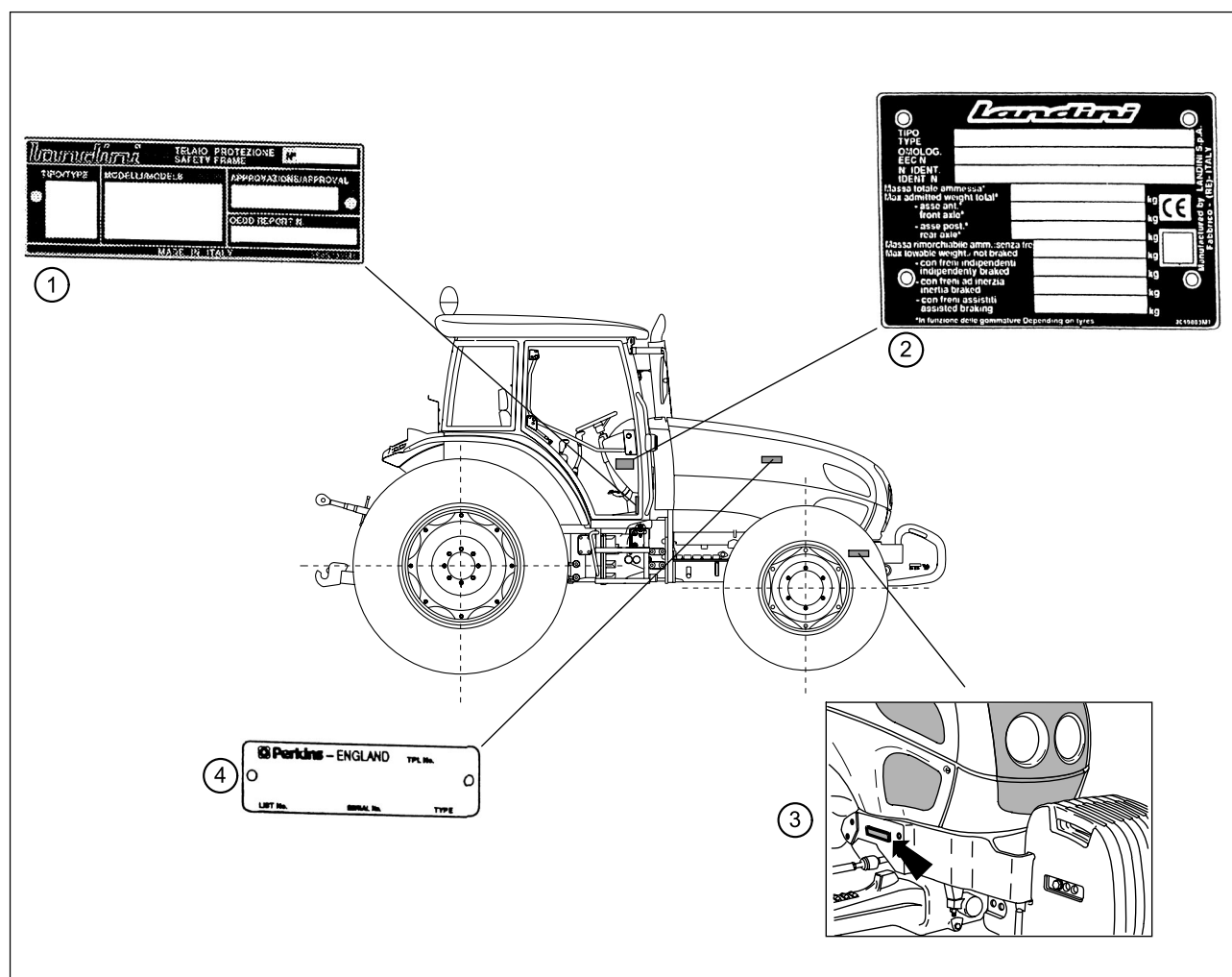


Fig.1-1

Introduction, warranty and safety notes

Chapter 2

Introduction, warranty and safety notes

2

Introduction and warranty

INTRODUCTION

NOTE: *This book is published for worldwide distribution, and the availability of equipment shown either as basic or accessory may vary according to the territory in which the tractor is to be operated. Full details of equipment available in your area can be obtained from your Dealer.*

The purpose of this book is to enable the owner and driver to operate the tractor in a safe manner. Providing that the instructions are followed carefully, the tractor will give years of service in our tradition.

The installation of the product by the Dealer gives the opportunity to ensure that these operating and maintenance instructions are understood. Always consult your Dealer if you do not understand any part of this book. It is important that these instructions are understood and observed. Daily maintenance should become a routine, and a record of hours in service should be kept.

When new parts are required it is important that only genuine service parts are used. Our authorized Dealers supply genuine parts and can give advice regarding their fitment and use. Extensive damage may occur as a result of the fitment of parts of inferior quality. Customers are advised to buy their service parts only from an authorized Dealer.

Owing to wide variations in operating conditions, it is impossible for the Company to make comprehensive or definitive statements in its publications regarding performance or methods of use of its machines, or to accept liability for any loss or damage which may result from these statements, or from any errors or omissions. If the tractor is to be used for abnormal conditions which may be detrimental (e.g. deep water or paddy fields) consult your Dealer for special instructions, or the warranty may be invalidated.

These tractors are designed solely for use in customary agricultural operations (intended use).

Use in any other way is considered as contrary to the intended use. The tractor manufacturer accepts no liability for any damage or injury resulting from misuse and these risks must be borne solely by the user.

Compliance with, and strict adherence to, the conditions of operation, service and repair as specified by the manufacturer also constitute essential elements for the intended use.

These tractors should be operated, serviced and repaired only by persons familiar with all their particular characteristics and who are acquainted with the relevant safety rules (accident prevention).

Customers are strongly advised to use an official authorized Dealer in connection with any service problems and adjustments that may occur.

WARRANTY, PRE-DELIVERY and INSTALLATION

The Company, when selling new goods to their Dealers, gives a warranty which, subject to certain conditions, guarantees that the goods are free from defects in material and workmanship. Since this book is published for worldwide circulation, it is impossible to detail the exact terms and conditions of warranty that apply to a retail customer in any particular country. Purchasers of new equipment should request full details from their supplying Dealer.

In accordance with the Company policy of continuous improvement to its machines, alterations in the specifications of machines may be made at any time without notice. The Company accepts no responsibility for discrepancies which may occur between the specifications of its machines and the descriptions thereof contained in its publications.

A Dealer is required to carry out certain activities when supplying a new tractor. These consist of a full pre-delivery inspection to ensure that the tractor supplied is ready for immediate use, and full instruction in the basic principles of operation and maintenance of the tractor. These instructions will cover instruments and controls, routine maintenance and safety precautions. All persons who will be concerned with the operation and maintenance of the machine should be present for these instructions.

NOTE: *The tractor manufacturer will not accept responsibility for any claim resulting from the fitment of non-approved parts or attachments, or unauthorized modification or alteration.*

Introduction and warranty

WARRANTY PROCEDURE

Correct installation, coupled with regular maintenance, will do much to prevent breakdowns. If, however, operating trouble is experienced during the warranty period, the following procedure must be adopted:-

Immediately notify the Dealer from whom you purchased the tractor, quoting the Model and Serial Number. It is most important that there should be no delay, and you should realise that, even where the original failure is covered by warranty, if the failure is not repaired immediately, warranty cover may not apply.

Provide your Dealer with as much background information as you can. It will help him to know how many hours service has been achieved, the type of work on which you are engaged and the symptoms of the trouble.

It should be noted that normal maintenance services such as tuning, brake/clutch adjustments, and the supply of materials used to service the tractor (oil, filters, fuel and antifreeze) are not covered by terms of the warranty.

PARTS WARNING

The fitment of non genuine parts may result in a part of substandard quality being used. The tractor manufacturer will not take the responsibility for any loss, damage or liability resulting from the fitment of such parts, and, if fitted during the normal warranty period the manufacturer's guarantee may be invalidated.

IF YOU MOVE

Only the official Dealer from whom you purchased the tractor is responsible for the protection afforded by your warranty and, where possible, you should always take the tractor to him for repair. If, however, you move to another area or if your tractor should be working temporarily at some distance from the Dealer from whom it was purchased, you are recommended to obtain from the original Dealer the name and address of the Dealer nearest to your new location and to ask for arrangements to be made for outstanding service warranty commitments to be transferred to the latter. If you have left the area in which the original Dealer operates and have not made arrangements with your new Dealer, the latter will readily provide assistance in an emergency but you will be charged at normal rates for any work undertaken unless:

- a. You make it clear that the warranty has not expired, and
- b. You give the repairing Dealer the opportunity to make suitable arrangements with the retailing Dealer.

SERVICE AFTER WARRANTY

During the warranty period, you should have all your repairs and maintenance performed by your Dealer. This ensures that a detailed check is kept on the progress and performance of your new tractor.

In order to obtain the best results from your tractor, it is important that regular maintenance and service checks continue after the warranty period has expired. Make use of your local Dealer for all major tractor services; a trained engineer will spot any problems between one service and the next.

The mechanics are regularly trained and updated on the product, servicing techniques and the use of modern service tools and diagnostic equipment. They receive regular Service Bulletins, have all Workshop Manuals and other such technical information to ensure that the repair or service is to the standard required.

SAFETY

The safety of the operator is one of the main concerns in designing and developing a new tractor. Designers build in as many safety features as possible. However, every year many accidents occur which could have been avoided by a few seconds thought and a more careful approach to handling farm machinery and implements.

Read and implement the safety instructions detailed in the next section of this book.



WARNING: *In some of the illustrations used in this Operator Instruction Book, panels or guards may have been removed for clarity. Never operate the tractor without these components in position. If the removal of panels or guards is necessary to make a repair, they MUST be replaced before operation.*

Safety notes

SAFETY ALERT SYMBOLS AND TERMS

This safety alert symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



The safety alert symbol identifies important safety messages on machines, safety signs, in manuals or elsewhere. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Why is SAFETY important to you?

★ **ACCIDENTS DISABLE and KILL** ★

★ **ACCIDENTS are COSTLY** ★

★ **ACCIDENTS can be AVOIDED** ★

SAFETY - TRACTOR and IMPLEMENT

- **The tractor is a source of power - Mechanical and hydraulic.**
- **On its own, the tractor is of little practical value. Only when used in conjunction with an implement or other attachment does it become a working unit.**
- **This instruction book is compiled to cover those safe working practices that are associated with the base tractor operation.**
- **It does not cover all operation and safety instructions relevant to all known implements and attachments that may be fitted at the time of tractor delivery or at some future date.**
- **It is essential that operators use and understand the relevant instruction manual of such implements and attachments.**

SAFETY - INTRODUCTION

This safety section of your Operator Instruction Book is intended to point out some of the basic safety situations which may be encountered during the normal operation and maintenance of your PLATFORM or CAB tractor, and to suggest possible ways of dealing with these situations. This section is **NOT** a replacement for other safety practices featured in other sections of this book.

Additional precautions may be necessary depending on attachments used and conditions at the work site or in the service area. The tractor manufacturer has no direct control over tractor application, operation, inspection, lubrication or maintenance. Therefore it is **YOUR** responsibility to use good safety practices in these areas.

SAFETY - A WORD TO THE OPERATOR

It is **YOUR** responsibility to read and understand the safety section in this manual before operating your tractor. You must follow these safety instructions that take you step by step through your working day.

In reading this section, you will note that illustrations have been used to highlight certain situations. Each illustration is numbered and the same number appears in the text in parenthesis. This number is placed at the end of the written text that refers to the illustration and is made up of two digits, separated by a hyphen: the first digit designates the chapter, the second one the figure number in that chapter (e.g.: Fig. 2-34 = Figure 34 of chapter 2).

Remember that **YOU** are the key to safety. Good safety practices not only protect you, but also the people around you. Study the features in this manual and make them a working part of your safety program.

Keep in mind that this safety section is written only for this type of machine. Practice all other usual and customary safe working precautions, and above all - REMEMBER - SAFETY IS YOUR RESPONSIBILITY. YOU CAN PREVENT SERIOUS INJURY OR DEATH.

SAFETY - DANGER, WARNING and CAUTION

Whenever you see the words and symbols shown below, used in this book and on decals, you MUST take note of their instructions as they relate to personal safety.



DANGER: The symbol and the word DANGER indicate an imminently hazardous situation which, if not avoided, will result in DEATH OR VERY SERIOUS INJURY.



WARNING: The symbol and the word WARNING indicate a potentially hazardous situation. If the instructions or procedures are not correctly followed it could result in DEATH OR SERIOUS INJURY.



CAUTION: This symbol and the word CAUTION indicate a potentially hazardous situation which, if not avoided, may result in MINOR INJURY.

IMPORTANT: The word IMPORTANT is used to identify special instructions or procedures which, if not strictly observed, could result in damage to, or destruction of the machine, process or its surroundings.

NOTE: The word NOTE is used to indicate points of particular interest for more efficient and convenient repair or operation.

SAFETY - DECALS



WARNING: DO NOT remove or obscure Danger, Warning, Caution or Instruction decals.

Replace any Danger, Warning, Caution or Instruction Decals that are not readable or are missing. Replacement decals are available from your Dealer in the event of loss or damage. The actual location of these Safety Decals is illustrated at the end of this section.

If a used tractor has been purchased, refer to the illustrations at the end of this section to ensure that all the safety warning decals are in the correct position and are readable.

SAFETY - FOLLOW A SAFETY PROGRAM

For safe operation

For safe operation of an agricultural tractor, you must be a qualified and authorized operator. To be qualified you must understand the written instructions supplied in this Operator Instruction Book, have training, and know the safety rules and regulations for the job.

Some regulations specify, for example, that no one under the age of 18 years (according to European Rules) may operate power machinery. This includes tractors. It is your responsibility to know what these regulations are, and obey them, in the operating area or situation.

These will include, but are not limited to, the following instructions for safe tractor operations.



WARNING: An operator should not use alcohol or drugs which can change his/her alertness or co-ordination. An operator on prescription or 'over the counter' drugs needs medical advice on whether or not he or she can properly operate machines.

Observe the following precautions

- NEVER allow children or unqualified persons to operate your tractor. Keep others away from your area of work.
- Securely fasten your seat belt when the tractor has a safety frame in the upright position or is fitted with a cab.
- Where possible, avoid operating the tractor near ditches, embankments and holes. Reduce speed when turning, crossing slopes, and on rough, slippery, or muddy surfaces.
- Stay off slopes too steep for safe operation.
- Watch where you are going, especially at row ends, on roads, and around trees.
- DO NOT permit others to ride on the tractor or the implement unless an approved passenger seat is fitted.
- Hitch only to the drawbar and recommended hitch points, and never above the centre line of the rear axle.
- Operate the tractor smoothly - no jerky turns, starts or stops. When the tractor is stopped, apply the parking brake securely.
- Never modify or remove any part of the equipment and never use attachments unless they are properly matched to your tractor.

Safety notes

SAFETY FRAME

(Landpower with cab only, version with safety frame not available, for a few markets only)

A Safety Structure and seat belt is fitted as standard equipment to the platform tractor at the time of factory assembly. If the safety frame was deleted by the original purchaser or has been removed, it is recommended that you equip your tractor with a Safety Structure and a seat belt. Safety frames are effective in reducing injuries during overturn accidents. A tractor overturning without safety frame can result in serious injury or death (Fig. 2-1).

Depending on laws in force in the various markets, a seat belt may be installed. Always raise the safety frame before fastening the seat belt.

If a fold-down safety frame is installed, DO NOT wear a seat belt when the safety frame is in the folded down position. NEVER keep the safety frame in the folded down position when working with the tractor.

Operation

- Before using the tractor ensure that the safety frame is not damaged, that it is securely fastened to the tractor, and, if a hinged section is fitted, that it is in the raised position and secured.
- If the safety frame has been removed from the tractor, or folded down for a specific operation, it must be refitted or erected immediately using the proper hardware and applying the recommended torque value.
- DO NOT ATTACH chains, ropes or cables to the safety frame for pulling purposes; this will cause the tractor to tip backwards. Always pull from the tractor drawbar.
- If a seat belt is installed, always wear your seat belt - adjusted snugly except when operating with a folded down safety frame or if the safety frame has been removed (Fig. 2-2).
- Check the seat belt for damage. A damaged seat belt must be replaced (Fig. 6).

Damage to the safety frame

If the tractor has rolled over or the safety frame has been damaged (such as striking an overhead object during transport), the safety frame must be replaced to provide the original degree of protection.

After an accident, check for damage to the safety frame, operator's seat, seat belt and seat belt mountings. Before you operate the tractor, replace all damaged parts.

DO NOT WELD, DRILL, BEND OR STRAIGHTEN THE SAFETY FRAME. To do so reduces the protection it offers.

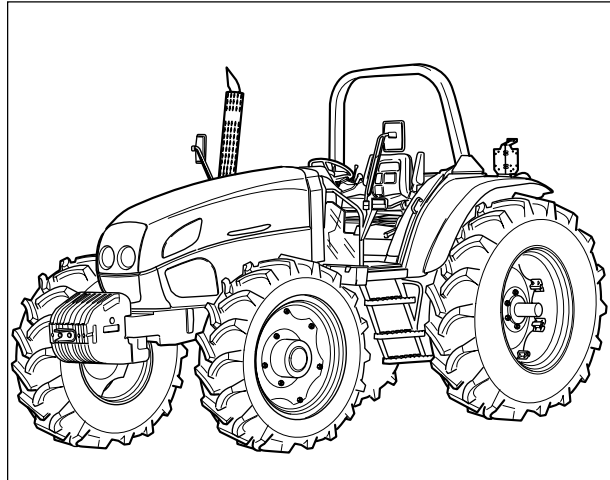


Fig. 2-1 - (Landpower with cab only, version with safety frame not available, for a few markets only)

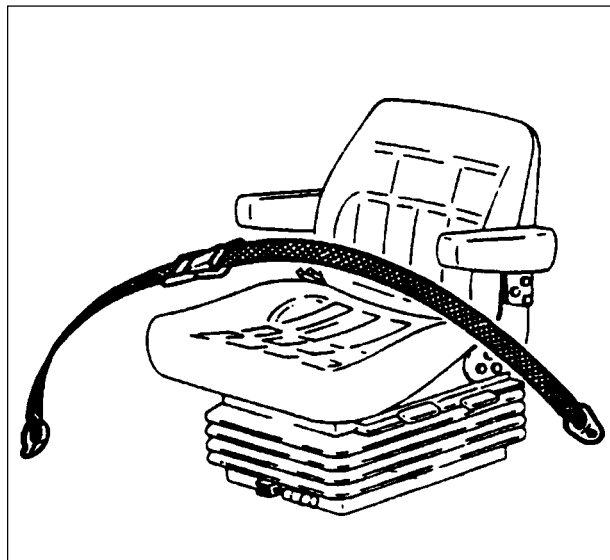


Fig.2-2

SAFETY - CAB

The cab has been designed for fitment to this series of tractors and meets all the legal requirements of cab safety and noise levels.

The cab conforms to the various international safety standards. The cab must NEVER be drilled, or modified to install accessories or implements. Welding components to the cab or repairing damaged components is NOT PERMITTED. Never attach chains or ropes to the main frame of the cab for pulling purposes.

SAFETY - PREPARE FOR SAFE OPERATION

Protect yourself

Wear all the protective clothing and personal safety devices issued to you or called for by job conditions. Don't take chances (Fig. 2-3).

You may need:

- A hard hat.
- Safety glasses, goggles or face shield.
- Hearing protection.
- Respirator or filter mask.
- Inclement weather clothing.
- Reflective clothing.
- Heavy gloves (neoprene for chemicals, leather for rough work).
- Safety shoes.

DO NOT wear loose clothing, jewellery or other items and tie up long hair which could catch on controls or other parts of the tractor.

Learn where fire extinguishers and first-aid or emergency equipment is kept and where to get help in a hurry. Make sure you know how to use this equipment (Fig. 2-5).

Know your equipment

Know your tractor. Know how to operate all equipment on your machine and the implements and attachments used with it. Know the purpose of all the controls, gauges and dials. Know the rated load capacity, speed range, braking and steering characteristics, turning radius, and operating clearances.

Keep in mind that rain, snow, ice, loose gravel, soft ground, etc. can change the way your tractor operates. *Under poor conditions, slow down and be extra careful, engage four-wheel drive, if fitted.*

Study the **DANGER, WARNING** or **CAUTION** safety signs on your tractor and the information signs also.

READ THIS OPERATOR INSTRUCTION BOOK BEFORE STARTING THE ENGINE.

STUDY IT BEFORE YOU START WORK (Fig. 2-4).

IF THERE IS SOMETHING IN THE MANUAL YOU DON'T UNDERSTAND, ASK SOMEONE (such as your equipment Dealer) TO EXPLAIN IT TO YOU.

IMPORTANT: *This manual covers general safe practices for agricultural tractors. It must always be kept with the tractor. For further copies contact your Dealer.*

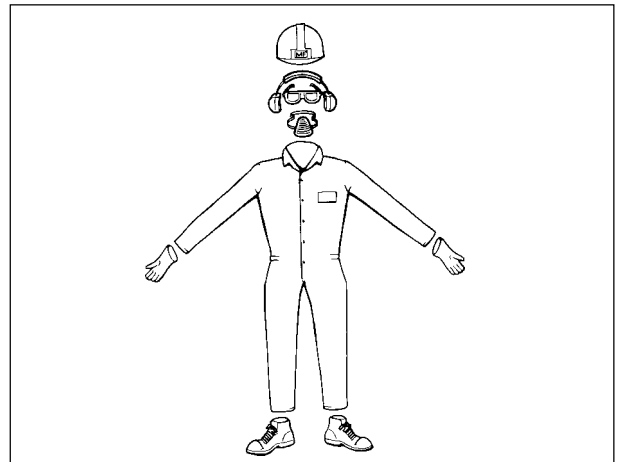


Fig.2-3

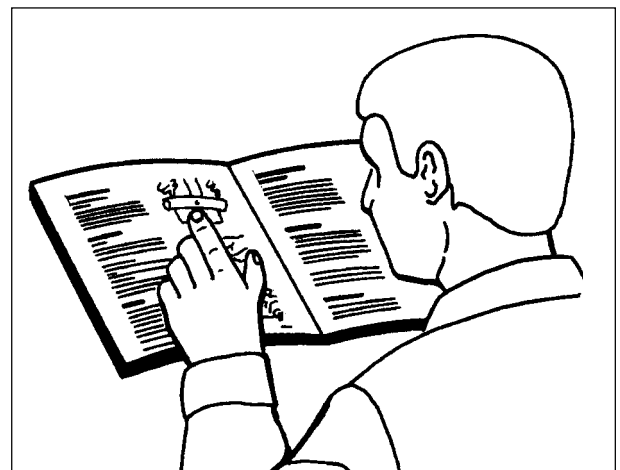


Fig.2-4

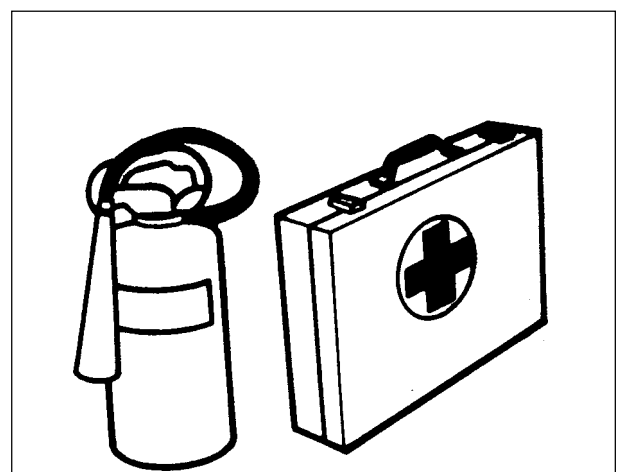


Fig.2-5

Safety notes

Use all available protective devices

Keep all protective devices in place and securely fastened. Make certain all guards, shields and safety signs are properly installed, as specified, and are in good condition.

To help keep you and others around you safe, your tractor should be equipped with:

- Safety belt. It must always be mounted in protection position (Fig. 2-6). A seat belt is recommended according to law requirements on the respective market. (Landpower with cab only, version with safety frame not available, for a few markets only).
- Tractor PTO shield.

Your tractor may also need:

- Rear view mirrors.
- Fire extinguisher.
- Safety frame with FOPS (Falling Object Protective Structure), protective enclosure or sun screens. Remember FOPS are protection from light falling objects and are not intended as protection from large falling objects such as large round bales or fence rails. For front loader operation see the corresponding Manual.
- **SMV** (Slow Moving Vehicle) emblem. Additional guards, lights or decals and an additional alarm (Fig. 2-38 and 2-39).

Know which devices are required for safe operation of your tractor. Use them. Make sure they are in place and in good condition. NEVER remove or disconnect any safety device.

Check the equipment

Before you begin your working day, take time to check your tractor and ensure that all systems are in good operational condition.

- DO NOT smoke while refuelling the tractor. Keep any type of open flame away (Fig. 2-7).
- Check for loose, broken, missing, or damaged parts. Have everything put into good repair. Make certain all safety devices are in place.
- Check safety frame and seat belt for damage. A damaged safety frame or seat belt **MUST** be replaced.
- Ensure that implements and attachments are properly installed and that the tractor and implement PTO RPM ratings match.
- Check the tires for cuts, bulges and correct pressure. Replace worn or damaged tyres. Check foot and parking brakes for proper operation. Adjust if necessary.

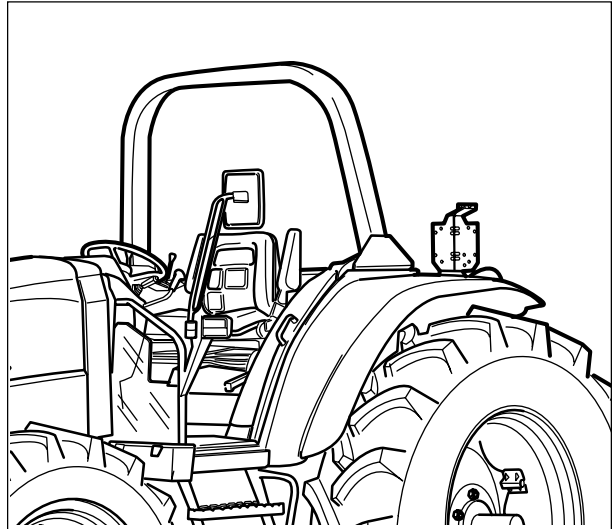


Fig. 2-6 - (Landpower with cab only, version with safety frame not available, for a few markets only).



Fig.2-7

Safety notes

- Stop the engine and wait for it to cool before refuelling.
- Check the engine oil level and add oil if required.
- Perform all maintenance procedures outlined in the maintenance and adjustment section of this manual.
- Check that the PTO drive locking devices are latched.
- Check that the tractor PTO shield and driveline guards are in place and operating properly.
- Check the tractor and implement hydraulic system. Have any leaks or damaged parts repaired or renewed.



WARNING: Diesel fuel or hydraulic fluid under pressure can penetrate the skin or eyes and cause serious personal injury, blindness or death. Fluid leaks, under pressure, may not be visible. Use a piece of cardboard or wood to find leaks. Never use your bare hand. Wear safety goggles for eye protection. If any fluid is injected into the skin, it **MUST** be surgically removed within a few hours by a doctor familiar with this type of injury (Fig. 2-8).

Before applying pressure to the fuel or hydraulic system, be sure all connections are tight and that lines, pipes, and hoses are not damaged. Before disconnecting fuel or hydraulic lines, be sure to relieve all pressure.

Make sure that all hydraulic lines are correctly installed and not tangled.



WARNING: Liquid cooling systems build up pressure as the engine gets hot. Before removing the radiator cap, stop the engine and let the system cool.

- Check the engine cooling system and add coolant as required.

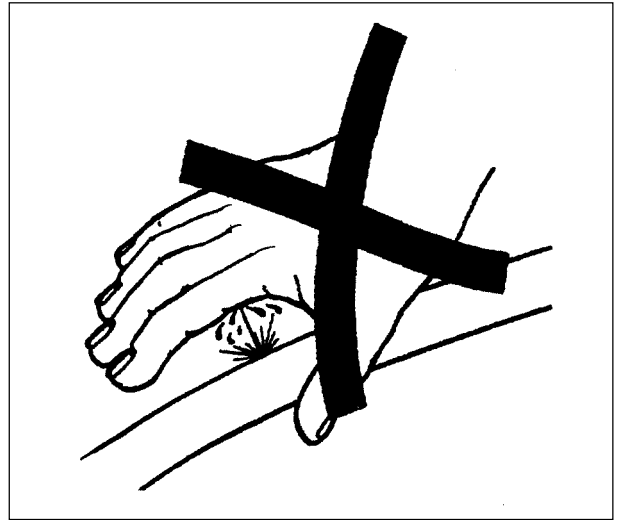


Fig.2-8

Clean the tractor

- Keep work surfaces and engine compartments clean.
- Before cleaning the machine, always lower implements to the ground, place transmission in neutral, engage the parking brake, shut off the engine and remove the key.
- Clean steps, pedals and floor. Remove grease or oil. Brush away dust or mud. In winter, scrape away snow and ice. Remember - slippery surfaces are dangerous.
- When plastic parts need to be cleaned (such as console, instrument panel, monitors, indicators a.s.o.), do not use petrol, paraffin, diluents etc. They could cause discoloration, cracking or warping of the cleaned parts.. These parts should **ONLY** be cleaned with water, neutral soap and a soft cloth.
- Remove and store implements, keys, hitches etc. in their proper places.

Safety notes

Protect the environment

- It is illegal to pollute drains, water courses or soil. Use authorized waste disposal facilities, including civic amenity sites and garages providing facilities for disposal of used oil. If in doubt, contact your local authority for advice.
- To get to know the correct methods to dispose of oils, filters, tyres etc. contact your Dealer or the local agency for waste recycling.
- Only for North America:
The safety sheets of each material give information on chemicals contained in a product, procedures to use it safely, first-aid and procedure to be followed in case of leakage or spills. In all North America such safety sheets are available at the Dealer's.
Before any maintenance on the machine, refer to the above mentioned safety sheets for fluids, oils etc. used in this machine. The sheets inform about risks and safe maintenance procedures. We strongly recommend to follow these indications during any maintenance operations.
- Disposal of the tractor: The tractor is made up of parts subject to rules and laws for their disposal. When the tractor is not used any more, it must be disposed of through proper agencies according to such rules. Do not pollute the environment with the tractor or its parts.

SAFETY - SERVICING THE TRACTOR

- DO NOT service the tractor while the engine is running or hot, or if the tractor is in motion (Fig. 13).
- Before making adjustments to, or servicing the electrical system, disconnect the battery cables, negative (-) cable first.
- To prevent fires or explosions keep open flames away from the battery or cold weather starting aids. To prevent sparks which could cause explosions use jump cables according to instructions.
- When making repairs or adjustments it is recommended that you consult your Dealer, and have the work carried out by trained personnel.
- The implement and/or tractor must be supported on suitable wooden blocks or stands, NOT a hydraulic jack.
- Check all nuts and bolts periodically for tightness, especially wheel hub and rim nuts. Tighten to the prescribed torque values.
- Check the power steering reservoir regularly and top-up as necessary with an approved oil.
- Check the brakes regularly, top up the reservoir and/or adjust where necessary. Make sure that the brakes are evenly adjusted, especially when using a trailer.

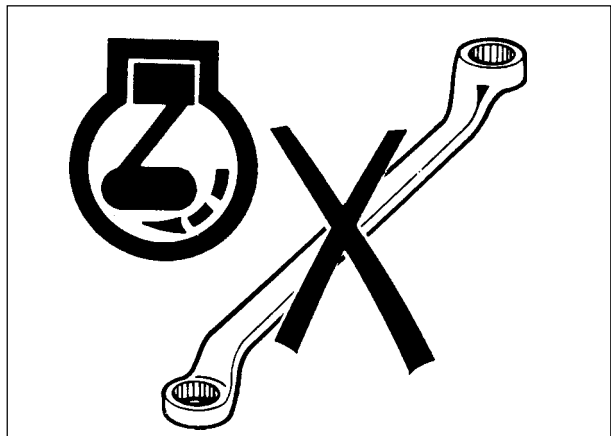


Fig.1-9

SAFETY - STARTING

Warn bystanders before starting.

Before starting, walk all around the tractor and any attached equipment. Make sure that no one is under it, on it, or close to it. Let other workers and bystanders know you are starting up and don't start until everyone is clear of the tractor, implements and towed equipment.

Ensure that all bystanders, **particularly children**, are in a safe position before starting the engine

Mount and dismount properly

Always use 'three point contact' with the machine, and face the machine when you mount it. Three point contact means both hands and one foot or one hand and both feet are in contact with the machine at all times during mounting and dismounting.

Clean the soles of your shoes and wipe your hands before climbing on. Use handrails, grab handles, ladders or steps (as provided) when mounting or dismounting.

NEVER use control levers as a hand hold and NEVER step on foot controls when mounting or dismounting.

NEVER attempt to mount or dismount from a moving tractor. NEVER jump off a tractor in any circumstances,

Start safely.



WARNING: Before starting the engine make sure there is plenty of ventilation. Never operate the engine in a closed building. The exhaust fumes may cause asphyxiation (Fig. 2-10).

Always start the engine from the operator's seat with all the transmission levers and the PTO lever in neutral.

Make sure that the tractor dual brake pedals are locked together at all times unless you are making turns in the field which require independent use of the brakes. Make sure the brakes are properly adjusted so that both brakes engage at the same time.

Adjust the seat, fasten the seat belt (where applicable as outlined in this manual), apply the parking brake and put all controls in neutral before starting up.

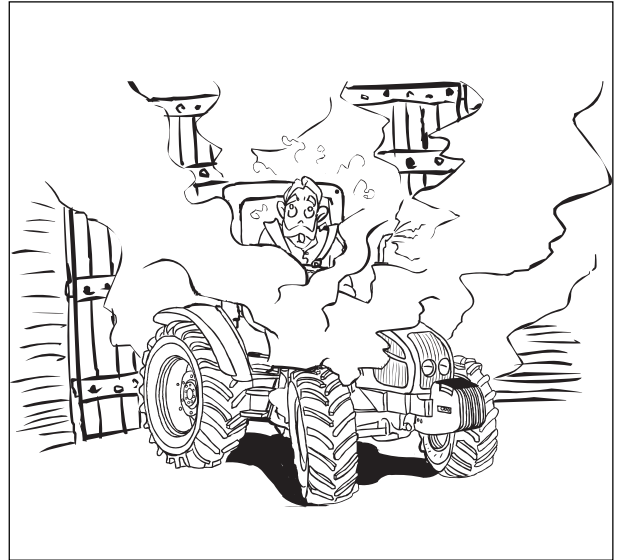


Fig.2-10



DANGER: Start the engine, with the starter key, from the operator's seat only. Never attempt to start the engine by shorting across the starter terminals. The machine will start in gear if the neutral start circuit is bypassed. This could cause serious injury or death to anyone near the tractor (Fig. 2-11).



Fig.2-11

Safety notes

Follow recommended starting procedures

Follow the starting procedures recommended in the Operation section of this Operator Instruction Book. This includes normal starting, cold starting, and the use of starting fluids.

Test the controls.

After starting, re-check all gauges and lights. Make sure everything is functioning correctly. If the tractor does not respond correctly when each control is operated, DO NOT use the machine until the fault is rectified.

Ensure that the starter solenoid cover is always in position.

Starting fluid



WARNING: *It is very important that you read the label on the can before using starting fluid. DO NOT use aerosol cans of starting aid on tractors with the thermostart connected to the electrical system. Either combined with thermostart can cause an explosion with damage to engine, personal injury or both.*

Handle starting fluid correctly. Starting fluid must only be used when an ether-start aid is fitted as original equipment by the manufacturer or when installed by a Dealer as an accessory. In case of tractors being fitted with glow plugs or thermostart, these must be removed prior to the installation (Fig. 2-12).

If aerosol cans of starting fluid are to be used the thermostart must be disconnected. Remove the wire from the thermostart unit which will be found on the induction manifold. Tape the end of the wire to prevent an electrical short circuit.

Before starting the tractor, ensure that no persons or hindrances are present in its range (Fig. 2-13).



Fig.2-12

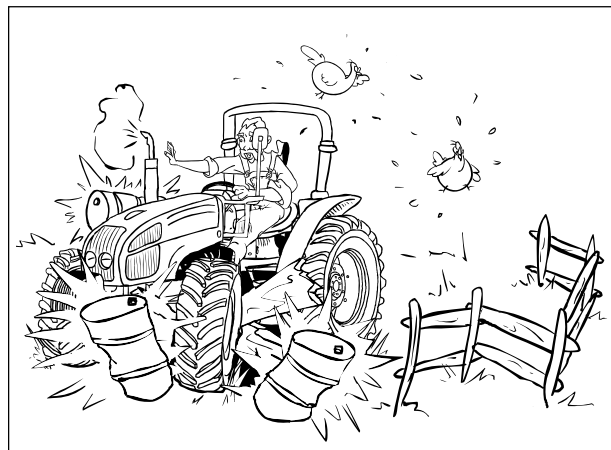


Fig.2-13

Safety notes

SAFETY - WORK SAFELY



WARNING: *An unbalanced tractor could overturn and cause injury or death. Make sure front frame counterweights, wheel weights and wheel ballast are used as recommended by the manufacturer. NEVER add extra counterweights to compensate for an overload, better to reduce the load.*



WARNING: *Keep all parts of your body inside the operator's compartment while operating the tractor.*

Make the right moves

Make sure your tractor is ready for the job it must do. Know the rated load capacities of your tractor and never exceed them. Be certain that any equipment or implements you intend to use DO NOT exceed the load rating of your tractor. Be sure the tractor and implement PTO rev/min match.

Keep in mind that tractors normally operate on uneven, unpaved, and often bumpy or sloping surfaces. Operating conditions can reduce the amount of weight you should carry or pull.

Follow safe operating practices

- Operate the controls smoothly - don't jerk the steering wheel or other controls.
- DO NOT get on or off a moving tractor. Keep a firm grip on the steering wheel at all times, with the thumbs clear of the spokes when driving the tractor.
- Make sure you have adequate clearance in all directions for tractor, cab, rollbar and implement.
- NEVER play games with a tractor or equipment.
- NEVER attempt to work the controls except from the operator's seat.
- Before getting off the tractor, always disengage the PTO, lower all attachments and implements to the ground, place the tractor in neutral, engage parking brake, shut off the engine and remove the key.

DO NOT touch, lean on, or reach through any implement mechanism or permit others to do so.

Stay alert. Should something break, come loose, or fail to operate in your equipment, stop work, shut off the engine, inspect the machine and have repairs or adjustments made before resuming operation.

Do not start the tractor without ensuring a perfect command of speed and steering controls (Fig.2-14).

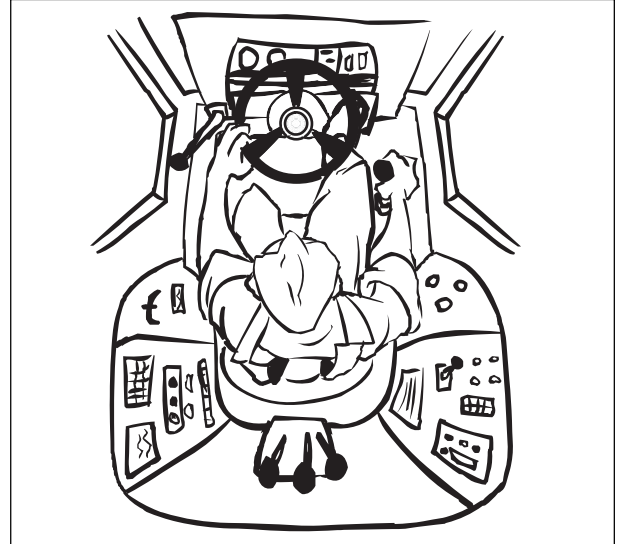


Fig.2-14

- Before starting, inspect the work area to establish the best and safest procedure. Plan your work so that you drive as straight as possible forward. Beware of trenches, pits, ditches, slopes, trunks or stumps, ponds etc. Watch for any possibly dangerous condition. If you are using a front loader or foldable implements or implements with high components, watch out for obstacle in the tractor's way.



WARNING: *Accidental contact with high-voltage lines causes death. In case of contact with high-voltage conductors DO NOT leave the tractor, but move the tractor and/or the loader in such a way as to eliminate the contact and reach a safe distance (Fig.2-15).*

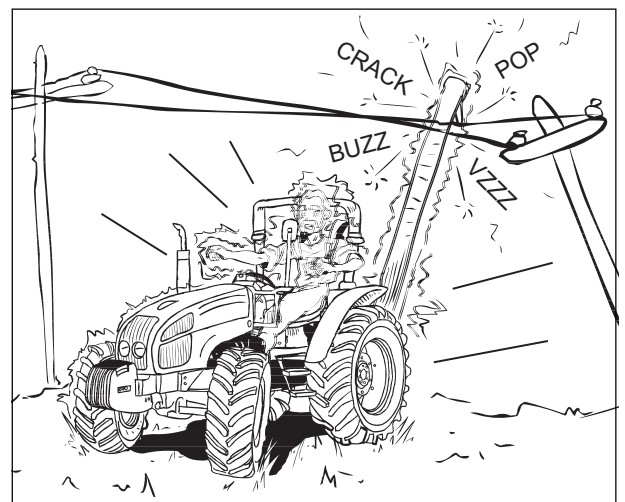


Fig.2-15

Safety notes

Watch out for others

- Be aware of what is going on. Never allow an untrained or unqualified person to operate your tractor. They could injure themselves or someone else.



WARNING: *Your tractor is a one-person machine. DO NOT permit others to ride on the tractor or the implement (Fig. 2-16). In some countries a passenger seat must be fitted to carry passengers. Never allow anyone to ride on the implements or other equipment including trailers, except on certain harvesting equipment, specifically designed for riders during the actual harvest operation only (not during transport). Such equipment must have provision for a safe riding area. NEVER allow children on a tractor.*



WARNING: *Be certain you can control both speed and direction before moving. Move slowly until you are sure that everything is operating properly. After starting, recheck the steering, right and left. Be certain you have full steering and brake control. If differential is locked, DO NOT operate at high speed or turn the tractor until the differential lock is disengaged.*



WARNING: *NEVER lift a load over anyone (Fig. 2-17).*

- Keep others away from your operation. Never allow anyone to stand or pass under a raised implement (Fig. 2-17).
- DO NOT lift objects that cannot be contained safely in the bucket, get the appropriate attachment. Never allow anyone to stand on the safety frame or fenders.
- When using a loader, avoid sudden stops, starts, turns, or change of direction. Keep loads as near to the ground as possible.
- Never stand (or allow anyone else to stand) in front of, under, or behind loaded or loading equipment. Never drive a tractor up to someone standing in front of a fixed object.
- Keep others away from articulation joints, hitches, drawbar, lift arms, PTO drives, cylinders, belts, pulleys, and other moving parts. Keep all shields and guards in place.



WARNING: *NEVER stand, or allow anyone else to stand between the tractor and implement unless the engine is turned off and the parking brake is engaged, the transmission is in neutral, and all attachments or implements are lowered to the ground.*



Fig.2-16

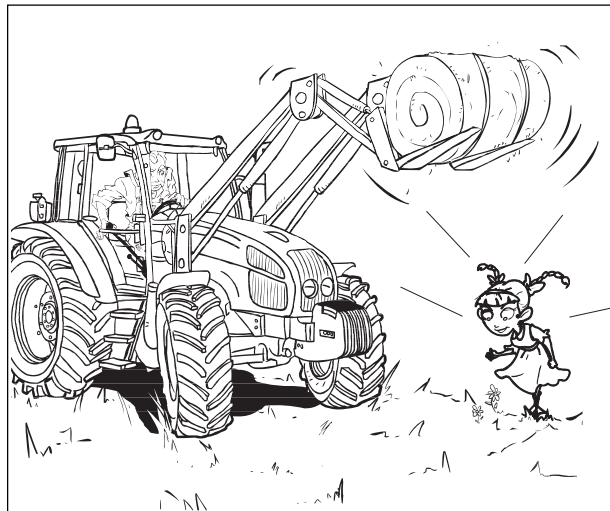


Fig.2-17

Risk of overturning

For your safety, it is recommended that all platform tractors are fitted with safety frame and seat belts (Fig. 2-18).

In the event of overturning with a tractor fitted with a cab or safety frame, hold the steering wheel firmly and DO NOT attempt to leave the seat until the tractor has come to rest. If the doors of the cab are obstructed, leave through the rear window or the roof hatch. (Fig. 2-18).

To avoid side overturns

- Set the wheel track at the widest setting suitable for the job being done.
- Lock the brake pedals together before driving at transport speeds.
- Reduce speed to match operating conditions. If the tractor is equipped with a front-end loader, carry the bucket and load as low as possible.
- Make wide slow turns at reduced speed. DON'T let your tractor bounce. You may lose steering control.
- DON'T pull a load too heavy for your tractor. It could run away on the down slope or the tractor could jackknife around a towed load (Fig. 2-19).
- DON'T brake suddenly. Apply brakes smoothly and gradually.
- When going down a slope use the throttle to slow the tractor engine and use the same gear you would use to go up the slope. Shift into gear before you start downhill.
- Engage four-wheel drive (if fitted), this will give four-wheel braking.



WARNING: NEVER disengage the clutch or attempt to shift gear after you have started downhill.

- It is always preferable to travel straight up or down a steep slope rather than across it.
- Do not overload a front-mounted implement or a trailer. Use suitable counterweights to keep the tractor stable (Fig. 2-20).
- Lock the drawbar in the middle position and use a safety chain when towing a load at transport speed.
- Never use the tractor to round up cattle or other livestock.

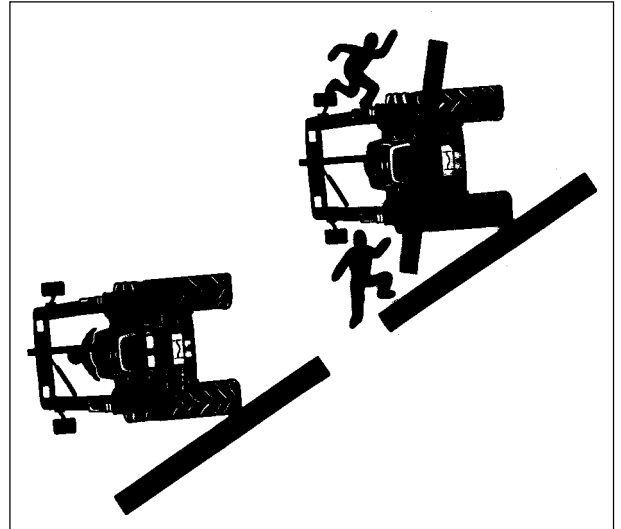


Fig.2-18



Fig.2-19



Fig.2-20

Safety notes

- When operating near ditches or banks, always keep your tractor behind the shear line (A, Fig.2-22). Avoid ditches, embankments and river banks which might cave in (Fig.2-21).

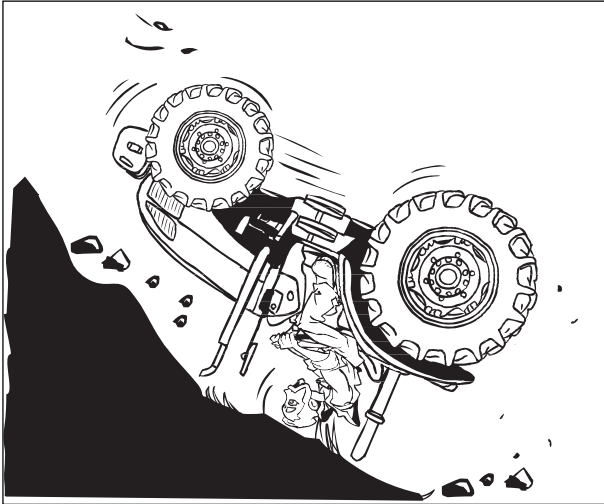


Fig.2-21

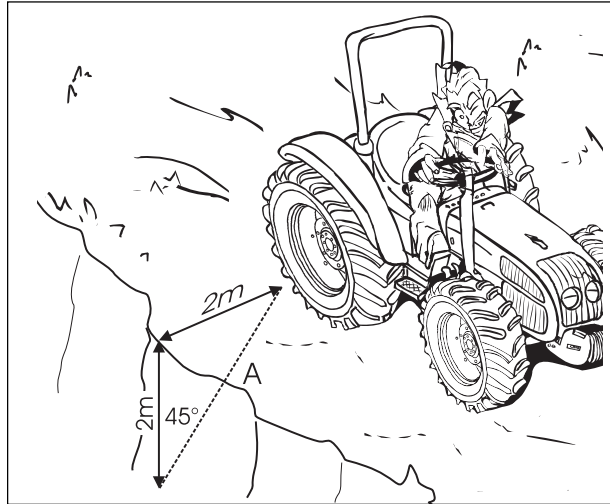


Fig.2-22

- If it is necessary to cross a steep slope, avoid turning uphill, slow down and make a wide turn. Travel directly up or down the slope, never across it. When travelling up or down a slope, keep the heavy end of the tractor pointed uphill. (Fig.2-23).
- When travelling across a slope with side mounted implements, keep the implement on the uphill side (Fig. 2-24). Don't raise the implements. Keep them as low to the ground as possible when crossing a slope.
- Avoid crossing steep slopes if possible. If you must do so, avoid any holes or depressions on the downhill side. Avoid any stumps, rocks, bumps or raised areas on the uphill side (Fig.2-25).

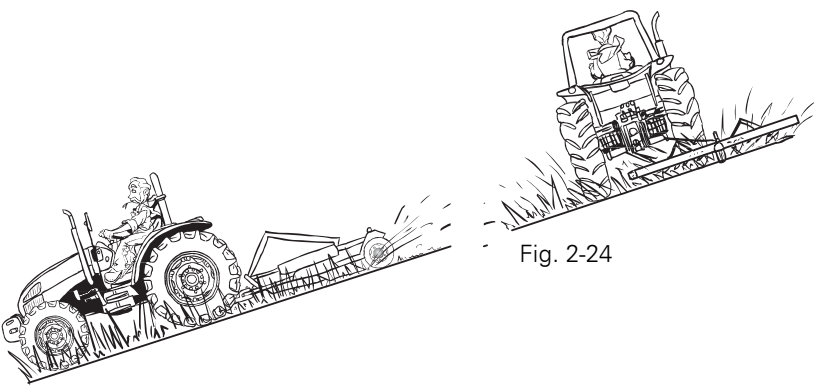


Fig. 2-24

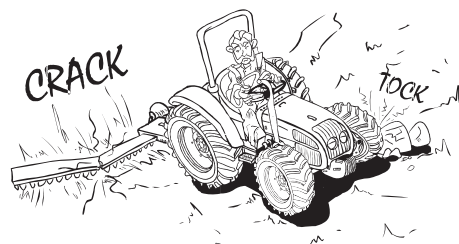


Fig. 2-25

Fig. 2-23

Safety notes

To avoid rear overruns



WARNING: *Hitching to the rear axle, or any other point above the swinging drawbar, can cause a rear overrun.*

- DO NOT pull anything using the top link connection, or from any point above the centre line of the rear axle. Always use an approved drawbar, and only use a drawbar pin that locks into place.
- High hitching can cause rear overrun, which may cause serious injury or death. Hitch loads to the drawbar only.
- When using a three-point linkage drawbar, the stays must be fitted and kept in the down position.
- Use front counterweights to increase tractor stability when towing a heavy load or to counter balance a heavy rear mounted implement (Fig.2-26).
- DO NOT overload your tractor and DO NOT ballast it beyond its carrying capacity. Never add ballast weight to counterbalance an overload. REDuce the load instead (Fig.2-27).



WARNING: *An overload is ALWAYS dangerous. Check the loading capacity of your tractor and NEVER overload (Fig.2-28).*

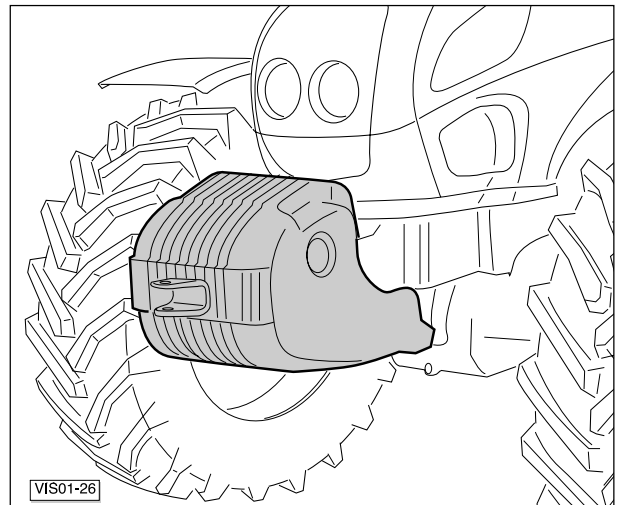


Fig. 2-26

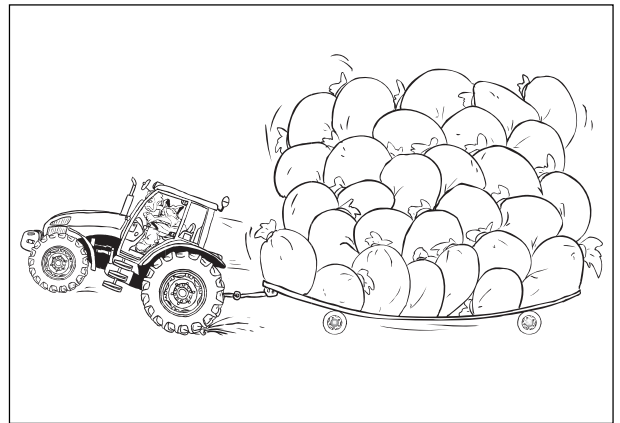


Fig. 2-27



Fig.2-28

Safety notes

- Start forward slowly and gradually increase your speed. DO NOT rev the engine or drop the clutch. If the tractor is attached to a heavy load, or immovable object, improper clutching may cause overturn (Fig. 2-30 and 2-31).
- If the front end of the tractor starts to lift, reduce your speed and, if necessary, disengage the clutch (Fig. 2-29).
- If your tractor is bogged down in mud or frozen to the ground, DO NOT attempt to drive forwards. The tractor can rotate around its rear wheels and overturn (Fig. 2-29). Lift any attached implement and attempt to BACK OUT. If this is not possible, tow it out with another vehicle.
- If you get stuck in a ditch, BACK OUT, if possible. If you must go forward, do it slowly and carefully.
- A bare tractor or a tractor with rear mounted attachments should be backed up the slope in reverse and travel forward downhill.
- A tractor with a loaded front-end bucket should be backed down the slope and travel forward uphill. Keep the loader bucket as low as possible.
- Always keep the tractor in gear when going downhill. Never permit the tractor to coast with clutch disengaged or transmission in neutral.

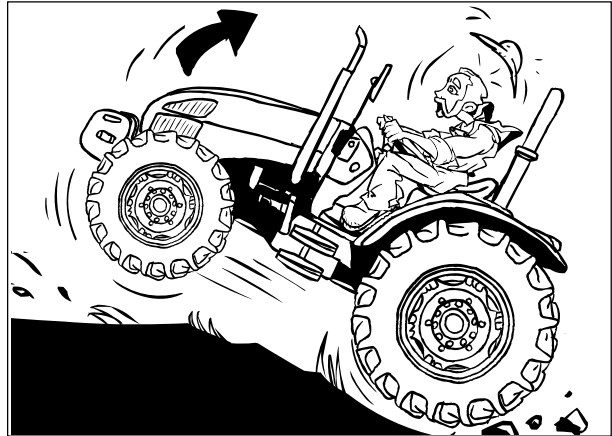


Fig. 2-29

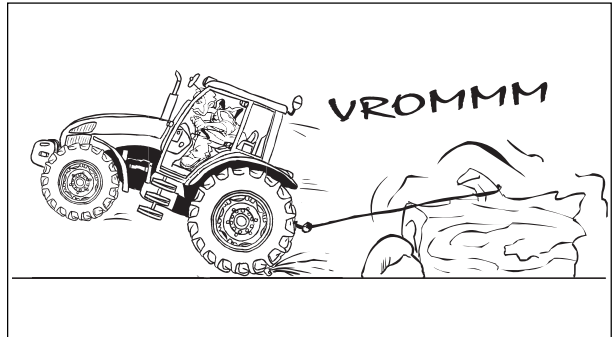


Fig.2-30

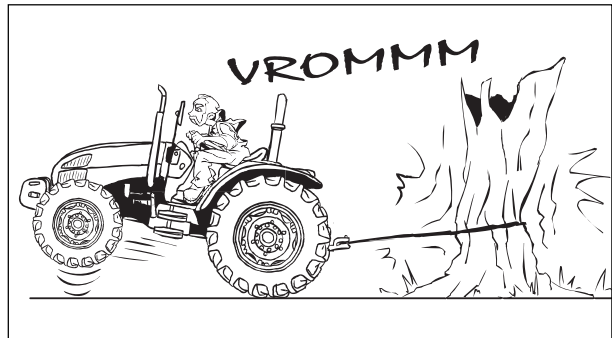


Fig.2-31

Safety notes

General operating hazards

- Ensure that the PTO shield (1) is in place and that the cap (2) is fitted when the PTO driveline is not in use (Fig. 2-32).
- Before attaching, detaching, cleaning or adjusting PTO driven implements, disengage the PTO, stop the engine, remove the key, and make sure that the PTO driveline has stopped (Fig. 2-33).
- Ensure that all the PTO driveline guards are in place and observe all safety signs.
- Be sure everyone is clear of your machine before engaging the PTO. For stationary PTO operation, always place transmission in neutral, engage parking brake and chock both tractor and implement wheels.
- When operating mobile PTO driven equipment, never leave the tractor seat until the PTO drive is disengaged, the transmission is in neutral, the parking brake is engaged, the engine shut off and the key removed.
- DO NOT use PTO adaptors, reducers or extensions as they extend the PTO coupler and universal joint out beyond the protection offered by the PTO shield.
- The top link and lift rods must not be extended beyond the point where threads begin to show.



WARNING: NEVER attempt to unplug the hydraulic connections, or adjust an implement with the engine running or the PTO drive in operation. To do so may result in serious injury or death (Fig. 2-34).

- When using chemicals, carefully follow the chemical manufacturer's instructions for use, storage and disposal. Also follow the chemical application equipment manufacturer's instructions.
- When operating under poor visibility conditions, or in the dark, use your tractor field lights and reduce your ground speed. (**DO NOT** use your field lights when travelling on a roadway because rear pointed white lights are illegal except when reversing and may confuse following drivers).
- Adjust the wheel-track to the max. width suitable for the work you are doing. See the Maintenance chapter for the correct adjustment.
- Reduce speed when working on uneven or slippery terrain, or when visibility is impaired by tree foliage.
- DO NOT make sharp turns at high speed.

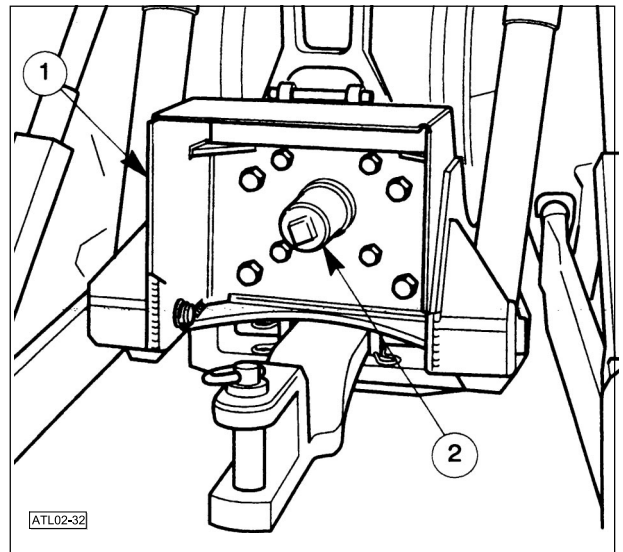


Fig.2-32

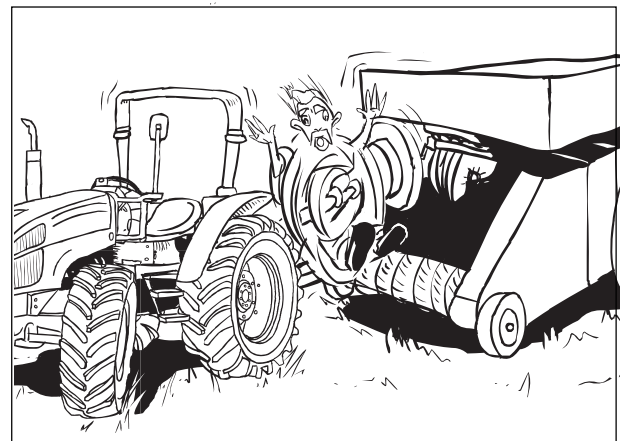


Fig.2-33

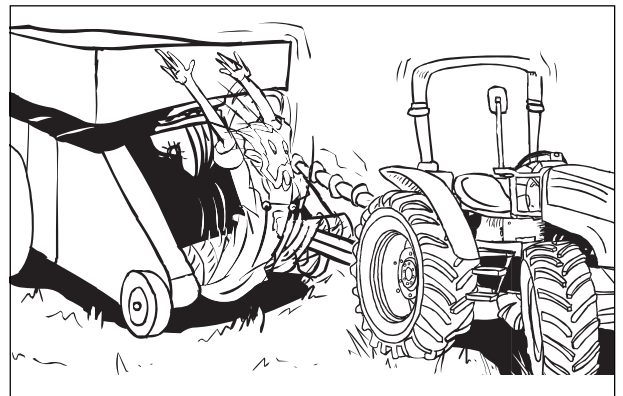


Fig.2-34

Safety notes

Implements and attachments.



WARNING: A front-end loader (bucket or forks) must be equipped with a suitable restraining device to prevent the load, bales, fence posts, rolls of fence, wire etc.) from rolling down the lift arms into the operator's compartment and crushing the driver when the loader is raised. Inadequately secured objects could also fall and injure bystanders. Do not use implements for different purposes or to handle materials they are not expected to (Fig. 2-37). For the operation of front loaders and relative safety rules, please refer to the Operation Manual of the loader.

- Three-point hitch and side mounted implements make a much larger arc when turning than towed equipment. Make certain to maintain sufficient clearance for safe turning.
- When using attachments or implements with the tractor, be sure to thoroughly read the Operator Instruction Book for that attachment or implement and follow its safety instructions.
- Pull only from the approved drawbar. Towing or attaching to other locations may cause the tractor to overturn (Fig. 2-36).
- Improper use of the drawbar, even if correctly positioned, may cause the tractor to overturn to the back.
- DO NOT overload an attachment or towed equipment. Use proper counterweights to maintain tractor stability. Hitch loads to the drawbar only.
- Use ballast as recommended. NEVER add more ballast to counterweight a greater load than allowed. Reduce the load.
- A safety chain will help control drawn equipment should it be accidentally separated from the drawbar while transporting. Using the proper adaptor parts, attach the chain to the tractor drawbar support or other specified anchor location. Provide only enough slack in the chain to permit turning. See your Dealer for a chain with a strength rating equal to, or greater than the gross weight of the towed machine (Fig. 2-35).

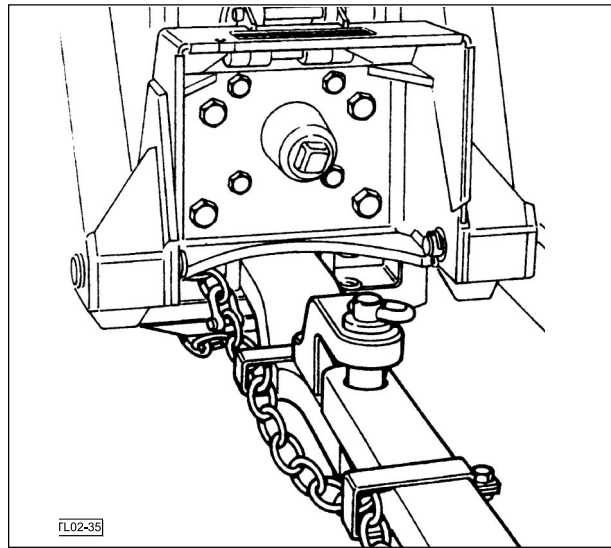


Fig.2-35

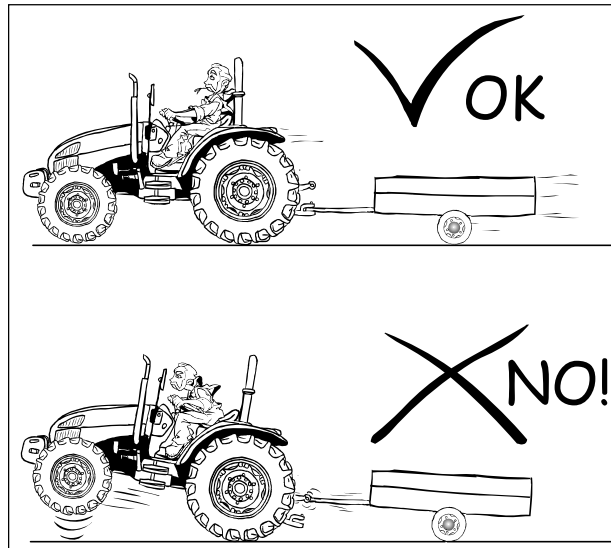


Fig. 2-36

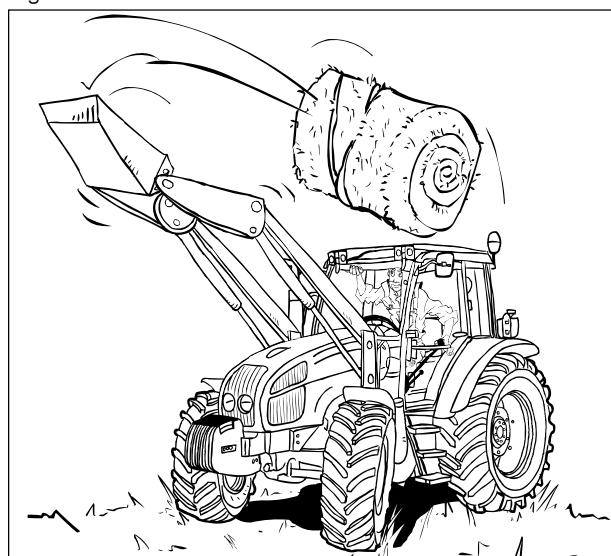


Fig.2-37

Safety notes

Road transport

Before operating your tractor on a public road, a number of precautions must be taken.

- Familiarise yourself - and comply - with all local by-laws, and national laws appropriate to your tractor.
- Lock your brake pedals together.
- Raise all implements to their transport position and lock them in place.
- Place all implements into their narrowest transport configuration.
- Disengage the PTO and differential lock.
- Make sure tractor and equipment are equipped with slow moving vehicle (SMV) signs or beacon if the law requires them (Fig. 2-38 and 2-39) and that loads do not obscure them.
- Make sure any required clearance flags or hazard lights are in place and in working order.
- Make sure you use a proper hitch pin with a clip retainer.
- Clean off all reflectors and road lights, front and rear, and be certain they are in working order.
- Implements mounted on the 3-point hitch and mounted implements projecting from the side need a wider turn radius than trailed implements. Always be sure to keep enough clearance when making a turn.

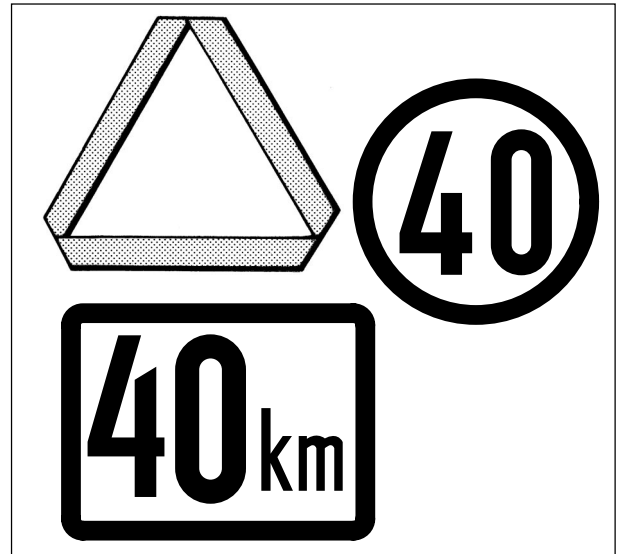


Fig. 2-38 Use the symbol valid in your country.

Road regulations

When operating your tractor on a public road a number of precautions must be taken.



WARNING: DO NOT allow any passengers on the tractor or towed equipment.

- Know the route you are going to travel.
- Use flashing lights or beacon when travelling on roads, day or night, unless prohibited by law (Fig. 2-39).
- Use caution when towing a load at transport speeds especially if the towed equipment is NOT equipped with brakes.
- Observe all local or national regulations regarding the road speed of your tractor.
- Use extreme caution when transporting on snow-covered or slippery roads.
- Wait for traffic to clear before entering a public road.
- Beware of blind intersections. Slow down until you have a clear view.
- DO NOT attempt to pass at any intersection.
- Slow down for turns and curves.

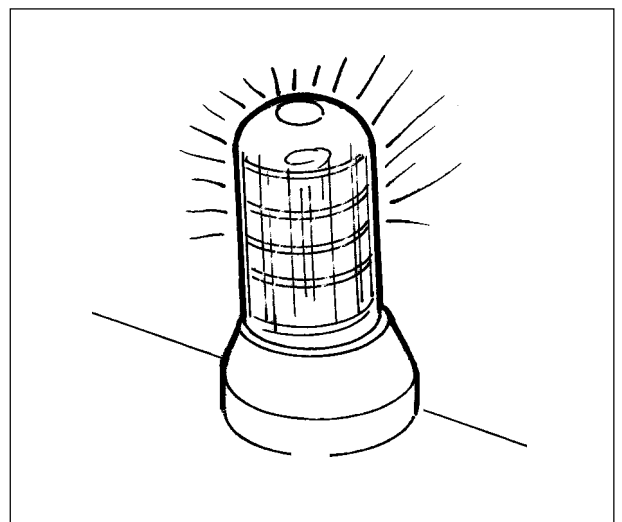


Fig.2-39

Safety notes

- Make wide, gentle turns.
- Signal your intent to slow, stop or turn.
- Shift to a lower gear before going up or down hills.
- Keep tractor in gear. Never coast with the clutch disengaged or transmission in neutral.
- STAY OUT of the path of oncoming traffic.
- Drive in your correct lane keeping as near to the kerb as possible.
- If traffic builds up behind you, pull off the road and let it go by.
- Drive defensively. Anticipate what other drivers might do.
- When towing a load, start braking sooner than normal and slow down gradually.
- Watch out for overhead obstacles.

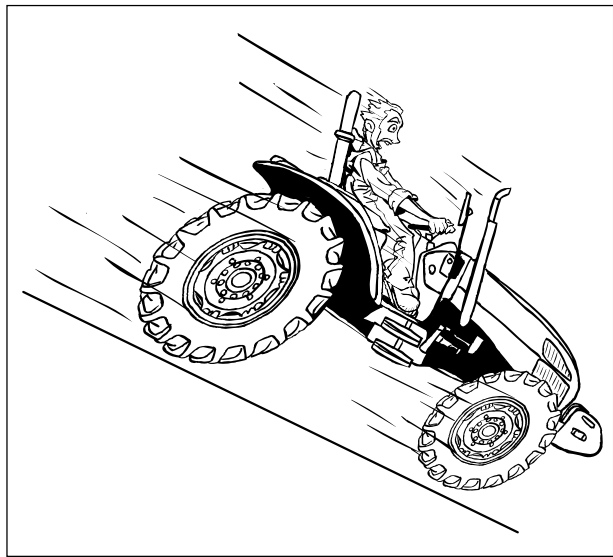


Fig.2-40

SAFETY - AFTER OPERATION

When stopping at any time, bring the tractor to a secure halt (DO NOT park on a slope), apply the parking brake, engage the Park-Lock (if installed), disengage the PTO, place all gear shift levers in neutral, lower the implement to the ground, stop the engine and remove the key BEFORE leaving the seat (Fig.2-41).

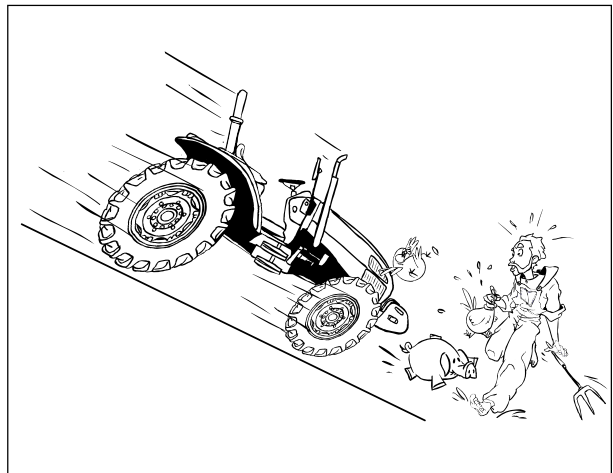


Fig.2-41

Additional notes

The following notes are designed to complete the Operation and Maintenance Manual to ensure that your tractor always works safely, reliably and efficiently.

Tractors are mainly designed for towing implements that are held by a drawbar or three-point linkage or for driving implements using the PTO.

To obtain the greatest possible towing force, particularly when using a tractor with dual rear wheels, you should observe the following rules concerning axle loads and wheel slip.

If an extra implement is attached, the extra loads must conform to the specifications given in the Manual or by your dealer.

1. Front axle payload: 4WD tractors.

The front axle normally bears 40% of the tractor weight on the road without implements; it may thus be necessary to add an extra weight on the front end to ensure that the front axle has traction.

If an implement is mounted on the front end of the tractor, check the weight of the fully loaded implement by placing the front axle on a scale: the maximum axle load must be less than the capacity of the front axle.

Check the maximum payload capacity of the front axle (maximum weight allowed on it) in your Operation and Maintenance Manual).

2. Rear axle payload.

The maximum permissible payload for the rear axle depends on whether or not the tractor is carrying a weight or towing a load.

When the tractor is only carrying a load, without towing, the wheels must have sufficient capacity that is ensured if the tyres are of the exact size and have the specified number of warps.

In certain conditions, extra weight may be applied to the rear axle but it is not normally necessary unless the ground offers very little grip.

When fully loaded, the weight of the tractor must be less than the maximum permissible ballasted weight since the tractor cannot be loaded right up to the maximum static payload for each of the axles, front and rear, at the same time.

3. Ballast and wheel slip.

Wheel slip must be measured for the tractor to operate efficiently during tillage.

On normal terrain in good operating conditions, wheel slip should be between 4 and 10%.

On loose soil, wheel slip can exceed 12%.

If wheel slip is found to be greater than this amount, proceed with care as operating conditions might quickly become unstable.

In certain conditions, it might be better to add ballast in order to reduce wheel slip, but this increases the workload of the transmission and thus reduces the working life of the tractor.

Your dealer will be able to help you ascertain the maximum ballast weight that you can use in your normal working conditions.

Using dual wheels or wider tyres, the tractor will have greater grip but the workload on the transmission will also be greater in dry and difficult soil conditions.

Dual wheels or wider tyres can sometimes be mounted for use on slippery or sandy terrain but the axle weight on hard, dry surfaces must be limited as the greater grip provided by wider tyres can damage the transmission.

The only torque limiter in transmission is wheel slip.

4. Front axle lead when four-wheel drive is engaged.

In a 4WD tractor, the ground speed of the front wheels must be slightly greater than that of the rear wheels, in order to ensure traction.

The front wheel advance must be between 1% and 4%.

Greater percentages may be used only on very soft ground.

The tyres supplied with your tractor have been checked for the correct advance of the front wheels, but when you change them, make sure you use tyres of the same make and size in order to maintain the same speed ratio between front and rear wheels.

If tyres of different makes are used, their size and internal pressure may modify this ground speed ratio, or advance. This could increase the load on the front axle and lead to unacceptable operating conditions, excessive tyre wear and, in extreme conditions, damage to the front axle or to the transmission.

Changes in the weight of the tractor, in the pressure or size of the tyres can cause the tyres themselves to bounce. This is not only annoying for the driver in the cab, but it can also cause a loss of grip and excessive wear in the transmission unit.

Safety notes

5. Economy PTO.

As shown in the Operation and Maintenance Manual, the economy PTO on large tractors is a feature that makes it possible to use the PTO at standard speed using lower RPM rates.

This feature can only be used when the implements powered by the PTO are to be used only for light operations, such as for sprinklers or rakes, which require less than 30 H.P.

The economy PTO does not need to use the maximum power of the engine but it is designed to save fuel.

When using the Economy PTO, make sure that the implement input shaft RPM NEVER exceeds the recommended RPM for the implement, e.g. max. 610 RPM for a 6 spline shaft, and max. 1170 RPM for a 21 spline shaft.

6. Working on slopes.

The Operation and Maintenance Manual provides information on using the tractor on slopes in conditions of safety.

It is also important to note that, when working on very steep slopes, the lubrication conditions in the transmission may be reduced. This is caused by the oil flowing towards the front or rear part of the transmission unit.

Special measures and extra lubrication may be required when using the tractor in conditions of safety.

Your dealer will be able to assist you if you expect to work on slopes of over 15°.

7. Remote hydraulic controls.

The hydraulic system of the tractor may be used in some particular applications to operate the hydraulic motors.

When using these applications, note that the hydraulic motors can generate considerable heat and the oil cooling system of the tractor may not be sufficient when these high-power hydraulic motors are used.

Some remote applications have an extra cooling system. However, every time they are used, make sure that the oil is cooled and filtered sufficiently in order to avoid damage to the tractor's hydraulic system.

8. Towing heavy loads (trailers, etc.)

When towing heavy loads at high speed, it may be necessary to have a supplementary braking system (e.g. trailer brakes) and greater ballast on the rear wheels in order to ensure sufficient braking power on the rear axle.

Check with your dealer possible additional requirements for special applications

9. Operating a dry-disc clutch.

Most tractors with a manual gearshift are equipped with a dry-disc clutch for changing gear.

Since the clutch slips every time the gear is changed, it can cause a certain amount of wear and thus create heat. To ensure long life for the clutch, it is thus advisable to reduce the load of the tractor and reduce engine speed when starting up the tractor from a standing position.

Prolonged slipping at high engine speed with large loads will cause the clutch disc to heat up, thereby reducing its working life.

10. Further instructions for the operator.

The Operation and Maintenance Manual provides instructions to ensure that the tractor is always used in conditions of safety.

If your tractor is also driven by other people, make sure that they are fully aware of these accident prevention instructions.

Passengers may only be carried on the tractor if they are sitting on a special passenger seat and have their seat belt fastened.

It is forbidden to carry anyone on the outer structure of the tractor in any circumstances.

This is because the safety frame is only designed to protect persons inside the cab or the safety frame.

If the tractor is equipped with a safety frame alone, it is unadvisable to transport passengers even using a special passenger seat.

11. Chemical filters for the cab.

Use of a filter with chemical absorbent in air-conditioned cabs can increase the degree of protection in certain applications but you must always read and understand the label on the chemical product to be used.

WARNING: PERSONAL PROTECTION EQUIPMENT MAY BE NECESSARY WHEN USING CHEMICAL SUBSTANCES.

Follow the instructions on the labels of the chemical substances and on the filters to be used.

12. Battery.

Decal on battery cover

WARNING

Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm.
Wash hands after handling.

Risks deriving from exposure to noise

Noise characteristics and measurement

Noise is a pressure variation in an elastic medium, generally the air, produced by the vibration of a material body (source) that determines an undesired and often annoying acoustic sensation. Noise is mainly characterized by:

- **sound intensity or level:** expresses the entity of the pressure variation due to the sound wave. Measured in decibels (dB), it doubles the sound intensity and, thus, the energy that reaches the ear.
- **frequency:** expresses the number of pressure variations of the wave per second and is measured in Herz (Hz) - acute noises have high frequencies (2000-4000 Hz or more) while low-pitched noises have low frequencies (250 Hz or less).

How the risk is evaluated

The higher the sound level and exposure time, the greater the noise risk will be.

Two parameters are used:

- **LAeq** (Equivalent continuous weighted level A): this is a sound level measurement that takes into account noise fluctuations and the varying sensitivity of the ear to the frequencies: LAeq is measured with a sound-level meter;
- **PEL** (Personal Exposure Level): this is a measurement that takes the various noise levels into account along with the time the worker remains on the individual machines or working at determined processes: PEL is calculated mathematically.

Noise pathologies

Damage to the hearing

Noise causes hypacusia or deafness because it destroys the acoustic receptors, nervous cells able to transform the mechanical sound vibrations into nervous impulses that, on reaching the brain, determine the aural sensation. These receptors are irreplaceable if they are destroyed and the resulting damage is irreversible: hypacusia worsens if exposure to noise continues and does not improve even if this terminates.

Moreover, it is also bilateral since it can be accompanied by annoying buzzing and whistling sounds, and by intolerance to loud noise.

The damage is insidious since it proceeds slowly and unexpectedly: in the initial phase, when it is limited to a diminished ability to perceive acute sounds (music, bells) or the spoken voice when there is a background noise, it can only be detected by means of an audiometric test. Pulsating noises of great intensity lasting a very short time are highly damaging since the ear is unable to actuate any physiological protective measures in time.

Hypacusia from noise generally arises after several years of exposure and depends on the PEL (risk almost null below 80 dBA) and on individual characteristics. It is an incurable disease: the only efficacious means of protection against it is prevention.

Other effects

Noise does not just determine aural sensation. For levels exceeding* 70 dBA, it causes stress by means of the cerebral integration centers and determines a specific neurovegetative reaction responsible for effects that lead to cardiocirculatory and gastroenteric diseases.

Amongst these, it is worthwhile noting: an increase in gastric acidity, a decrease in the heart rate, visual range and reflex speed; a sensation of discomfort and weariness with an increased sense of fatigue.

These effects are dangerous because they also increase the risk of accidents.

Personal equipment to protect against noise

Individual protective equipment attenuates the sound energy transmitted to the ear through the air.

This equipment is used when dangerous exposure cannot be avoided in any other way.

There are different types of devices with different attenuating capacities: helmets, ear muffs, ear plugs (Fig. 2-42).

Helmets and ear muffs offer the greatest protection but they are bulky and inconvenient to wear. They are therefore only of use for exposure to high noise levels but for short periods of time (max. 2 hours).

Ear plugs are generally tolerated to a greater extent and are of particular use in the case of lengthy exposure to noise of a lesser intensity.

Always use adequate individual protective equipment to safeguard the hearing when the personal daily level of exposure to noise is 85 dBA or more.

Consult the "Specifications" chapter of this manual in relation to tractor noise measured in instantaneous conditions in compliance with the laws in force.

CAUTION: Do not open the front, rear or side windows, nor any doors, during work. The noise inside the cab would increase to such an extent as to require the operator to wear ear muffs or other individual protection gear against noise.

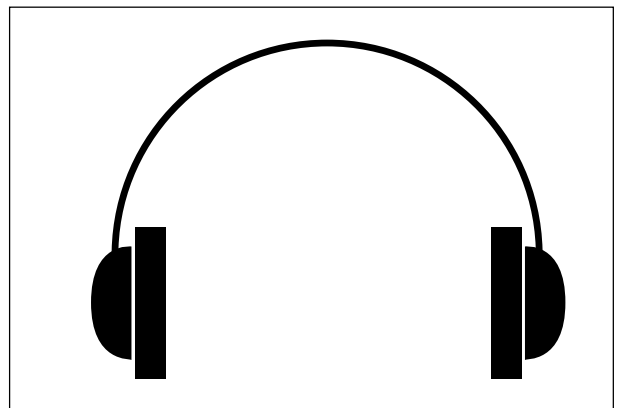


Fig.2-42

Safety notes

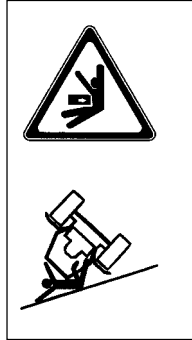
POSITION OF SAFETY NOTES ON TRACTOR - WEO Markets

For this decal pack, order part N° **3559 552 M93**

3559 557 M1

Inside the cab, on upper lining or on left-hand fender for platform tractors.

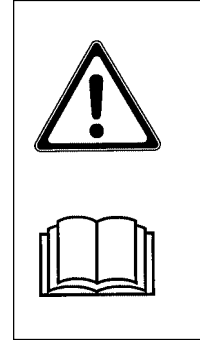
DANGER: Risk of overturning and crushing the chest. If the tractor is tipping over, hold tightly on to the steering wheel. DO NOT leave your seat or jump off the tractor.



3559 558 M1

Inside the cab, on upper lining or on left-hand fender for platform tractors.

WARNING: Caution. Read the safety and operating instructions in the Operation and Maintenance Manual.



3648 447 M1

Tractors with safety belts. Placed on the post in the cab, or on left-hand fender for platform tractors.

WARNING: Danger of being crushed. When safety belts are worn, the safety frame must always be in the upright position.



3647 158 M1

Inside the hood side door near the battery support.

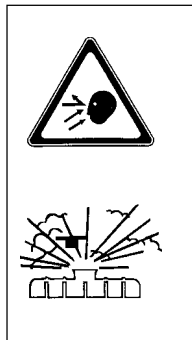
WARNING: Risk of electrocution. Always disconnect the negative lead before the positive lead when removing the battery or servicing the electrical system.



3559 554 M1

Placed on the expansion vessel of engine cooling circuit.

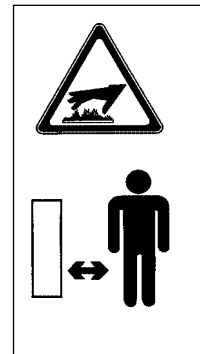
DANGER: Hot steam or water jets. Protect your face. Radiator under pressure when engine is hot. Remove cap with caution only when engine is cold.



3664 275 M1

On both sides of the radiator or on intake manifold.

WARNING: Hot surfaces. Risk of burns to hands and fingers. Warning. Keep well clear of hot components, keep at a safe distance.



3559 556 M1

On the right-hand and left-hand sides of radiator or on shroud.

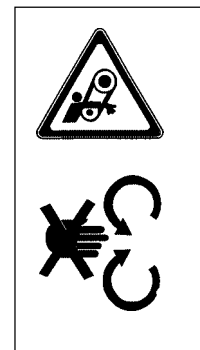
WARNING: Danger of entanglement. Keep hands well clear of fan blades when engine is running. Keep guards and screens in place.



3559 559 M1

On both sides of the radiator or on intake manifold.

WARNING: Danger of entanglement. Keep hands well clear of moving parts and be careful not to get caught up in belts or pulleys when engine is on. Keep guards in place.



Safety notes

3647 032 M1

On rear lining inside the cab for tractors without passenger seat, on left-hand fender for platform tractors.

WARNING: Risk of being crushed. DO NOT allow any passenger to sit on the fenders or on any other part of the tractor or towed implements.



3559 553 M1

Inside the rear fender.

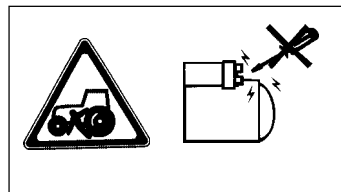
DANGER: Risk of entanglement. Keep clear of rotating shafts. Be careful NOT to get caught up by the cardan shaft of the PTO drive-line. Keep all guards in place on the transmission shafts on the tractor and implements.



3648 152 M1

On the starter motor

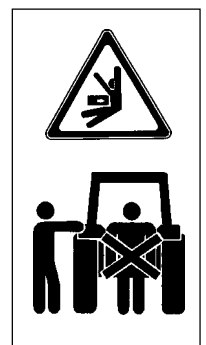
DANGER: Risk of being crushed. DO NOT short across starter terminals to start the engine. This operation could put your life at risk. Start engine only from driving seat.



3647 463 M1

On the rear left-hand fender, only with electronic power lift.

DANGER: Risk of blows and serious accidents. Keep to one side of the tractor when using external lift controls. NEVER STAND between tractor and implement - you could be hit by the implement.



3559 555 M1

On the starter motor.

WARNING: Risk of electrocution. Always disconnect the negative terminal of the battery before removing the solenoid cover and before servicing the electrical system.



3647 299 M1

On the rear right-hand fender, only with electronic power lift.

DANGER: Risk of blows and serious accidents. Keep to one side of the tractor when using external lift controls. NEVER STAND between tractor and implement - you could be hit by the implement.



3647 033 M1

On safety frame for tractors with platform.

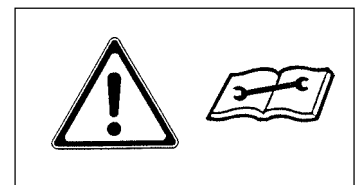
WARNING: Risk of overturning and crushing. Always keep the safety frame mounted during work. Never use the tractor without the safety frame.



3647 157 M1

Near the fluid reservoir of the brake system.

WARNING: Risk of damage to the brake system. Carefully read the safety warnings and instructions in the Operation and Maintenance Manual before servicing.

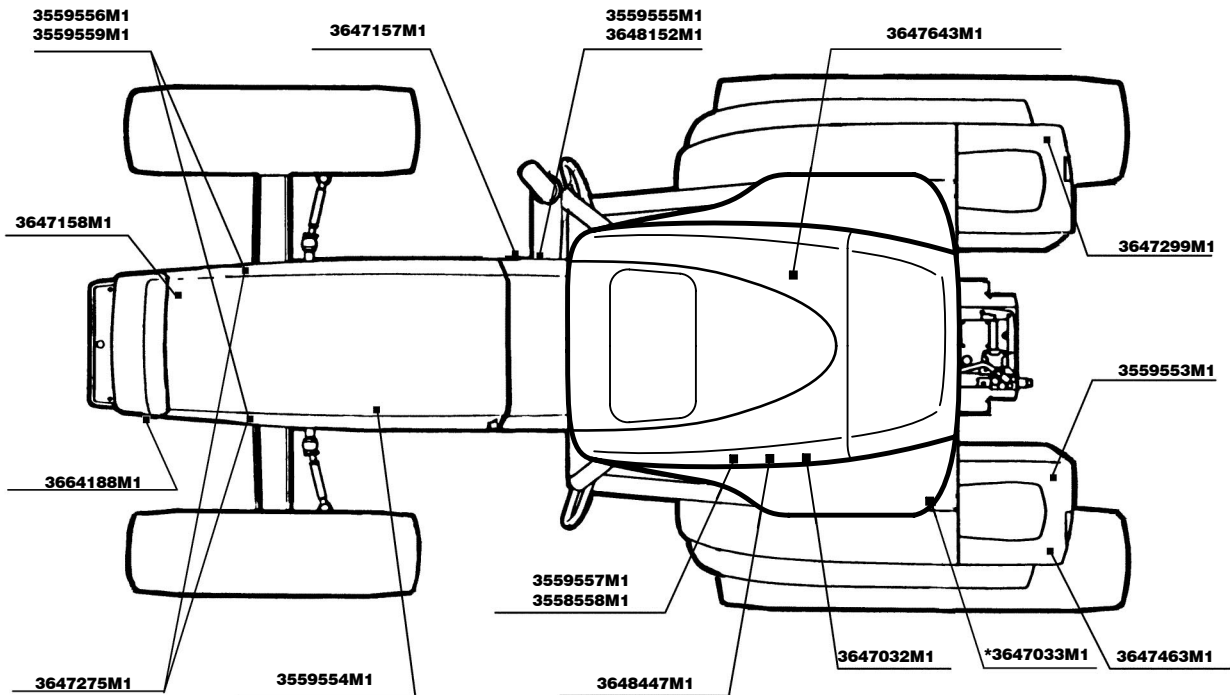


Safety notes

POSITION OF SAFETY NOTES ON TRACTOR - WEO Markets

For this decal pack, order part N° **3559 552 M94**

Fig. 2-43 Positions of decals



*For platform tractors only

3664188 M1

Near the front loader

DANGER: Beware of hanging loads. Keep a safe distance to avoid being hit or crushed.



3647275 M1

On both sides of the radiator or on intake manifold.

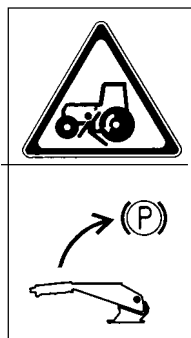
WARNING: Hot surfaces. Risk of burns to hands and fingers. Warning. Keep well clear of hot components, keep at a safe distance. When the engine is on, always keep the guards mounted.



3647643 M1

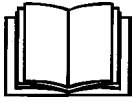
Near the parking brake lever.

DANGER: Danger of being crushed. Whenever you stop the tractor, always pull the parking brake lever BEFORE leaving the tractor..



Safety notes

⚠ CAUTION



Read the operator instruction Book for safety information and operating instructions.

Fasten your seat belt before tractor operation.

Start engine only when seated in operator's seat.

Make sure everyone is clear of tractor and equipment before starting engine or operation.

Keep all shields, covers and guards in place and stay away from moving parts while engine is running.

Place transmission shift lever in neutral and apply parking brake before using external 3-point hitch controls.

Apply parking brake, lower equipment, stop engine and remove key before leaving the tractor unattended.

Wait for all movement to stop before servicing tractor or equipment.

Securely support or block lifted implements which must be in the raised position for servicing or adjustment.

Couple brake pedals together for road travel.

Use flashing warning lights and SMV emblem when on public roads, except where prohibited by law.

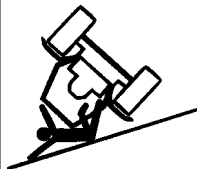
Always drive with care and attention.

⚠ WARNING



USE SEAT BELT.

Keep seat belt adjusted snugly



Do not jump if tractor tips

3558707M1

Located inside cab on right - hand pillar or on the left fender for footstep tractors.

SAFETY DECAL LOCATIONS - NORTH AMERICA

For this decal pack order part No. 3558702M96

3558703M1

Located inside cab on left - hand pillar or on the left-hand fender for footstep tractors.



⚠ DANGER

Start only from seat with transmission and PTO in neutral.

Starting in gear kills.

3648153M1

Located on the starter motor.



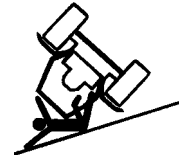
⚠ WARNING

Remove negative cables from batteries before removing solenoid cover and before servicing the electrical system.

3558705M1

Located on the starter motor.

⚠ WARNING



Whenever clearance permits:

- Keep Rollover Protection Structure fully extended and locked.
- Keep seat belt fastened.

When structure must be lowered:

- Drive with extra care.
 - Seat belt use is not recommended.
- No ROPS protection is provided in the lowered position.

3647053M1

Located on the safety ROPS for footstep tractor.

⚠ WARNING

Use only mineral type brake fluid as specified in the Operator's Manual.

Incorrect fluid could cause brake system failure and loss of control, resulting in personal injury or death.

3647156M1

Located near the brake reservoir bracket on the hood rear bracket or on the dashboard.

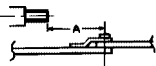
Safety Notes

⚠ WARNING

Personal injury could result from PTO driveline separation.

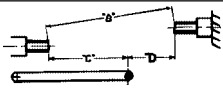
1. Drawbar supplied provides standard distance "A". Do not change.

PTO	SHAFT SIZE	DISTANCE "A"
540	35mm (1.38 in)	356mm (14.0 in)
1000	35mm (1.38 in)	406mm (16.0 in)



2. Three-point link distance "C" and mounter implement distance "D" may not be standard.

Measure distance "B" over complete lift range for tractor and implement combination. Select driveline length to ensure that driveline will not bottom out at minimum distance "B" and will have sufficient overlap at maximum distance.



3558709M1

Located at rear of cab on the inner side of the left fender

⚠ DANGER



EXPLOSIVE GASES

Always shield eyes and face from battery. Cigarettes, flames or sparks could cause battery to explode. Do not charge or use booster cables or adjust post connections without proper instructions or training.

POISON causes severe burns

Contains sulphuric acid. Avoid contact with skin, eyes or clothing. In event of accident flush with water and call a physician immediately. **Keep out of reach of children.**

3558711M1

Located inside the battery cover



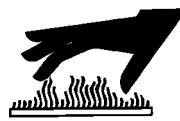
⚠ WARNING

High pressure steam and hot water. Remove filler cap with extreme care.

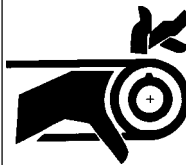
3558708M1

Located over the radiator.

⚠ WARNING



Beware hot parts



To avoid personal injury, keep all shields, covers and guards in place while engine is running.

3558706M1

Located on right-hand and left-hand side of radiator, or on the air conveyor.

⚠ WARNING

Serious personal injury or machine damage may result from overspeed of PTO driven equipment.

Select tractor PTO speed to match implement specified speed.

Do not operate PTO above recommended maximum speed.

Nominal	Maximum
540	630
1000	1170

3558710M1

Located inside cab on the left-hand pillar or on the rear fender for footstep tractors.

⚠ DANGER ⚠ DANGER



Pull only from approved drawbar or lower links of 3-point linkage at horizontal position or below.



Rotating driveline contact may cause serious injury or death. Keep all driveline, tractor and equipment shields in place during operation.

3558704M1

Located at rear of cab on the rear window fender.

⚠ WARNING



Stand clear when using switch to move 3-point hitch.

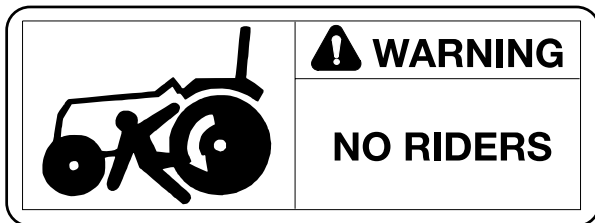
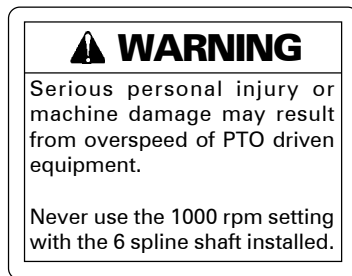
3647155M1

Located at rear of cab or on the rear fenders only with electronic lift.

Safety notes

3649794M1

Located on PTO cover.

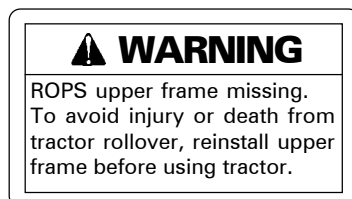


3649711M1

Located on the rear fender

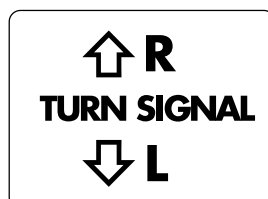
3658327M1

Located on the ROPS
(Only on platform tractors)



3658323M1

Located rear the turn switch

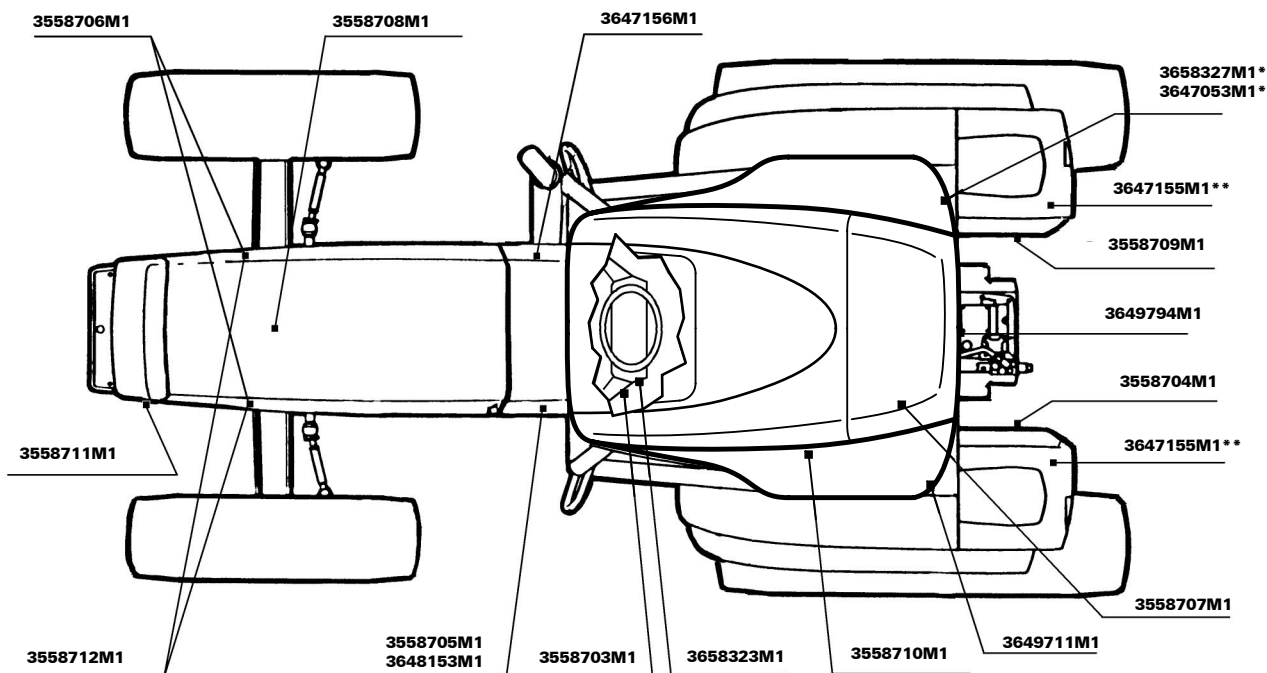


Safety Notes

POSITION OF SAFETY NOTICES ON TRACTOR

For this decal pack, order part n. **3558702M96**
North America markets

Fig.2-44 LOCATION ON CAB TRACTORS



*Only with safety frame

**Only with electronic lift

Instruments and controls

Chapter 3 Instruments and controls

3

Instruments and controls

Instruments and controls - Top and Top-Tronic (Fig. 3-1)

NOTE: Consult the 'Operation' chapter for instructions on how to correctly use the controls.

- 1 Reverse shuttle lever.
- 2 Instrument panel.
- 3 Rotating beacon and hazard light switches.
- 4 Steering wheel height adjuster knob.
- 5 Brake pedals.
- 6 Accelerator pedal.
- 7 Speed selector lever.
- 8 Joystick.
- 9 Range selector lever (Low - Standard - High).
- 10 Electronic power lift controls.
- 11 Parking brake engagement lever.
- 12 Park-Lock lever (Top-Tronic only).
- 13 Light switch and horn.
- 14 Clutch pedal.

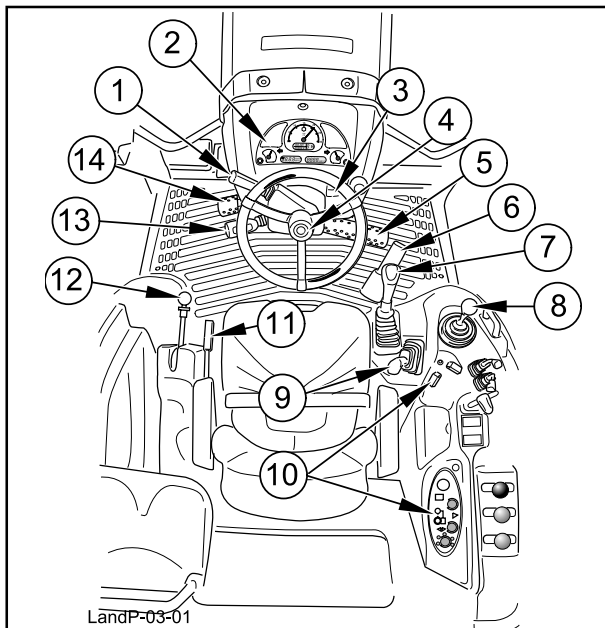


Fig.3-1

Right-hand controls - Top and Top-Tronic (Fig. 3-2)

- 1 Joystick.
- 2 Up/down switch of electronic power lift.
- 3 Auxiliary control valve levers.
- 4 PTO switch.
- 5 Cruise Control buttons.
- 6 Hand throttle lever:
 - up: idling
 - down: full acceleration.
- 7 Auxiliary control valve lever and switch valve for hydraulic controls of three-point linkage (standard on Top-Tronic. On request for Top).
- 8 Creeper lever.
- 9 PTO mode selector lever (independent or proportional to ground speed).
- 10 PTO speed selector lever.

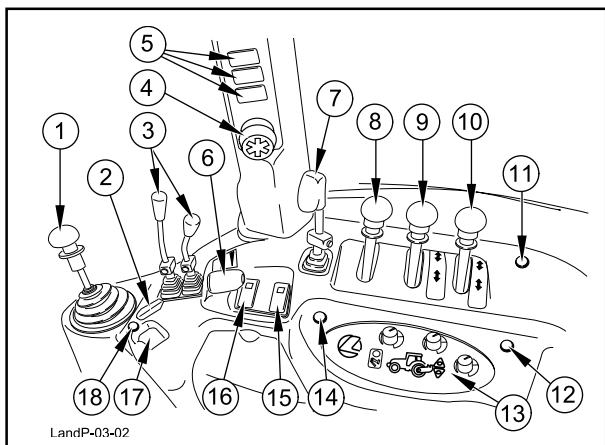


Fig.3-2

- 11 Auxiliary power socket.
- 12 Cigarette lighter
- 13 Up/down switch and electronic power lift control panel.
- 14 Yellow range selector button for Powersix (Top only).
- 15 Differential lock button.
- 16 4WD button.
- 17 Work depth adjustment with electronic power lift.
- 18 Orange quick soil engagement button with electronic power lift.

Instruments and controls

Instruments and controls - Mechanical lift and hydraulic PTO (Fig. 3-3a) Top

NOTE: Consult the 'Operation' chapter for instructions on how to correctly use the controls.

- 1 Reverse shuttle lever.
- 2 Instrument panel.
- 3 Rotating beacon and hazard light switches.
- 4 Steering wheel height adjuster knob.
- 5 Brake pedals.
- 6 Accelerator pedal.
- 7 Speed selector lever.
- 8 Joystick.
- 9 Range selector lever (Low - Standard - High).
- 10 Mechanical power lift controls.
- 11 Parking brake engagement lever.
- 13 Light switch and horn.
- 14 Clutch pedal.

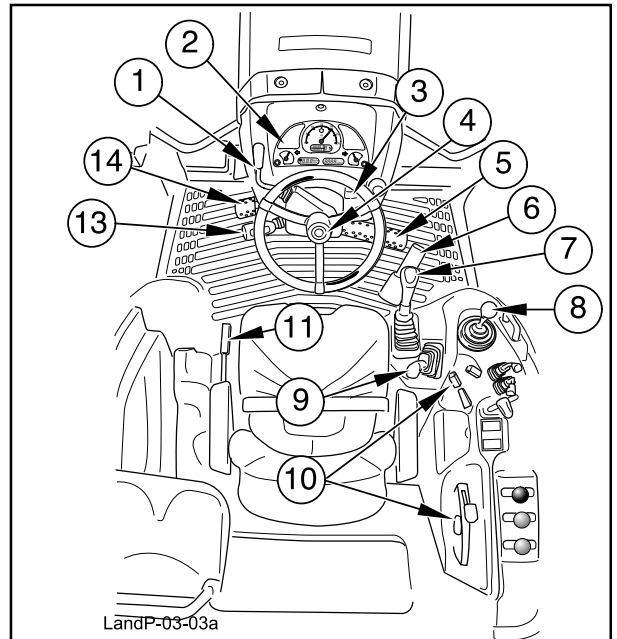


Fig.3-3a

Right-hand controls - Top (Fig. 3-3b)

- 1 Joystick.
- 2 Up/down switch of mechanical power lift (on request)
- 3 Auxiliary control valve levers.
- 4 PTO switch.
- 5 Cruise Control buttons.
- 6 Hand throttle lever:
 - up: idling
 - down: full acceleration.
- 7 Auxiliary control valve lever and switch valve for hydraulic controls of three-point linkage (On request for Top).
- 8 Creeper lever.
- 9 PTO mode selector lever (independent or proportional to ground speed).
- 10 PTO speed selector lever.

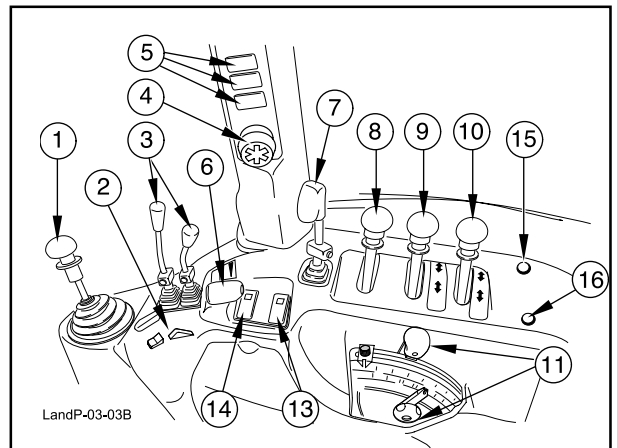


Fig.3-3b

- 11 Up/down switch and mechanical power lift control panel.
- 13 Differential lock button.
- 14 4WD button.
- 15 Auxiliary power socket.
- 16 Cigarette lighter

Instruments and controls

Instruments and controls - Mechanical lift and mechanical PTO (Fig. 3-4a) Techno

NOTE: Consult the 'Operation' chapter for instructions on how to correctly use the controls.

- 1 Reverse shuttle lever.
- 2 Instrument panel.
- 3 Rotating beacon and hazard light switches.
- 4 Steering wheel height adjuster knob.
- 5 Brake pedals.
- 6 Accelerator pedal.
- 7 Speed selector lever.
- 8 Joystick.
- 9 Range selector lever (Low - Standard - High).
- 10 Mechanical power lift controls.
- 11 Parking brake engagement lever.
- 12 PTO clutch engagement lever.
- 13 Light switch and horn.
- 14 Clutch pedal.

Right-hand controls - Techno (Fig. 3-4b)

- 1 Joystick.
- 2 Up/down switch of mechanical power lift (on request)
- 3 Auxiliary control valve levers.
- 4 Hand throttle lever:
 - up: idling
 - down: full acceleration.
- 5 Cruise Control buttons.
- 6 Auxiliary control valve lever and switch valve for hydraulic controls of three-point linkage (On request for Top).
- 7 Creeper lever.
- 8 PTO mode selector lever (independent or proportional to ground speed).

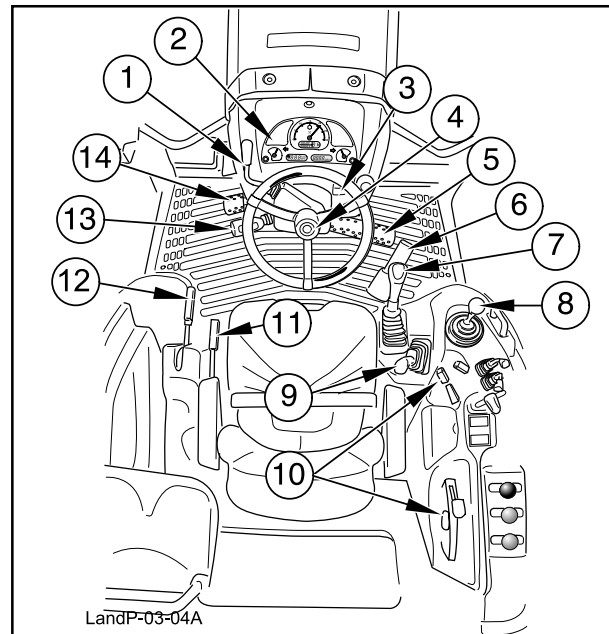


Fig.3-4a

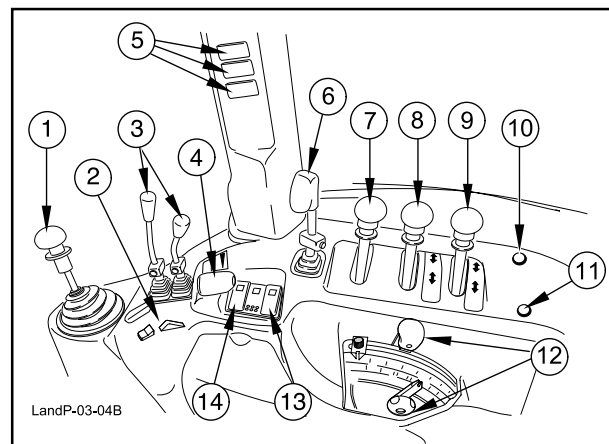


Fig.3-4b

- 9 PTO speed selector lever.
- 10 Auxiliary power socket.
- 11 Cigarette lighter
- 12 Up/down switch and mechanical power lift control panel.
- 13 Differential lock button.
- 14 4WD button.

Instruments and controls

Dashboard

Ignition switch (3 - Fig. 3-5 - Fig. 3-6)

- 1** • *No circuit powered. Engine stopped. The key can be removed.*
- 2** • *Contact position. Various users powered. Indicators and controls on.*
- 3** • *Thermostarter preheating position for cold weather starting.*
- 4** • *Engine start position. Key automatically returns to power on position when released.*

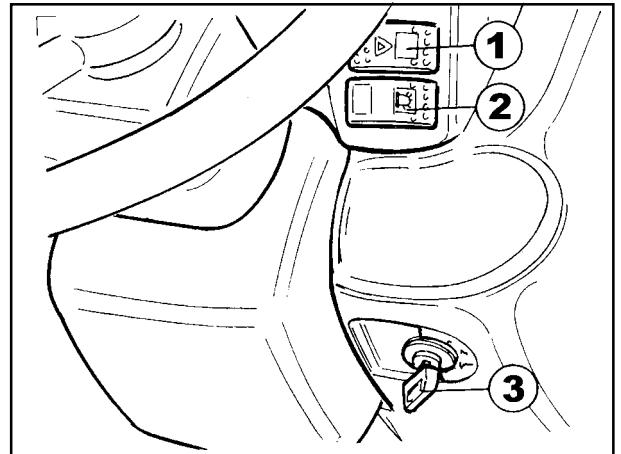


Fig.3-5

Hazard light switch (1 - Fig. 3-6)

0 - Off.

1 - Hazard lights on.

Rotating beacon switch (with light switch on) (2 - Fig. 3-5)

0 - Off.

1 - Rotating beacon on.

Light switch (1 - Fig. 3-7)

- 1 - Light switch for direction indicators and horn. Only operates with ignition switch in the contact position.
- 2 - Forward: right hand direction indicator.
- 3 - Back: left hand direction indicator.
- 4 - Pressed: horn.

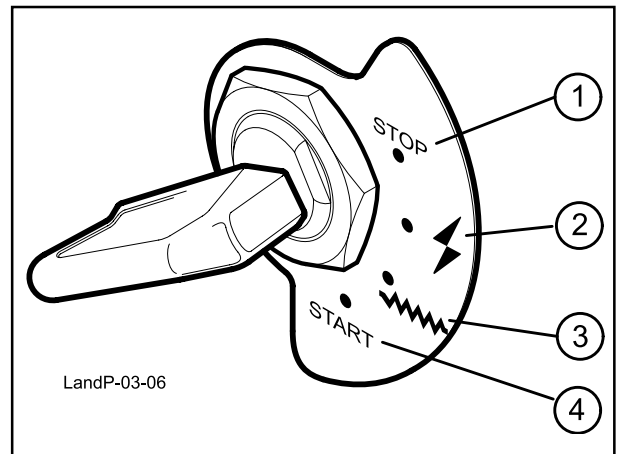


Fig.3-6

- 1 - Road light switch: turn the knob at the end of the lever to operate the lights.



Lights off.



Side lights on.



Dipped beams.
Pushed down: driving beams.

Warning buzzer

The buzzer will start operating if the red warning light indicating low pressure in the transmission hydraulic circuit comes on. Immediately contact your Dealer's Specialized Workshop if this occurs.

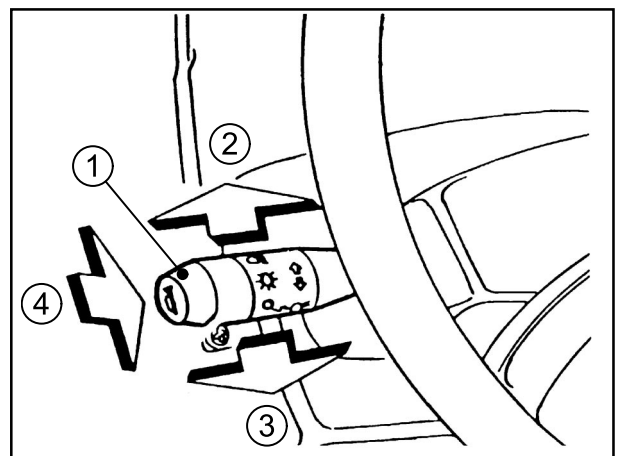


Fig.3-7

Instruments and controls

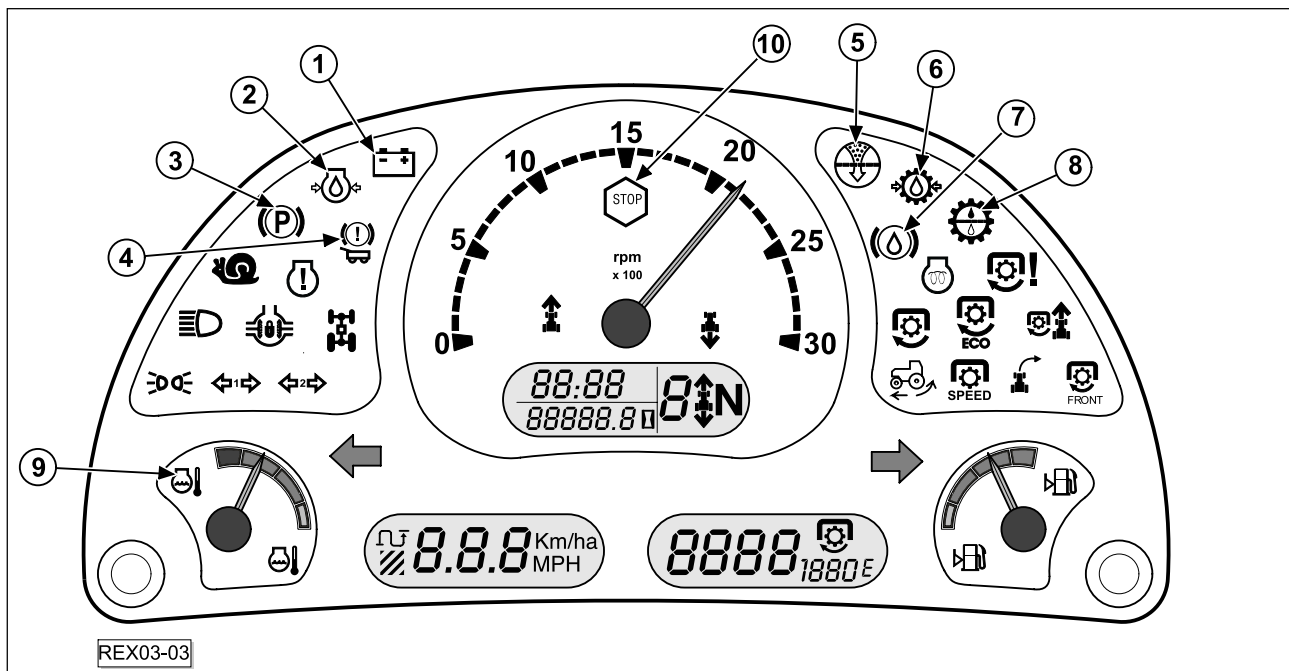


Fig. 3-8 Instrument panel

Instrument panel

Warning lights (Fig.3-8)

- 1 - *Battery charging warning light - red.* Should go out as soon as the engine starts.
- 2 - *Engine oil pressure warning light - red.* Should go out as soon as the engine starts. It is quite normal for this light to come on if a hot engine is left to idle.
- 3 - *Red warning light.* It comes on when the parking brake is engaged.
- 4 - *Red warning light for low pressure in hydraulic circuit of trailer brake* (if mounted and depending on the market).
- 5 - *Dry air filter blockage warning light - red.* It comes on when the cartridge needs cleaning or replacing.
- 6 - *Red warning light (steady) for low pressure in hydraulic transmission system.* If it comes on during work, ask your Dealer's specialized workshop for help.
- 7 - *Red warning light.* Check the oil level in the brake fluid reservoir. Top up with designated fluid.
- 8 - *Red warning light (steady) for transmission and hydraulic system oil filter blockage.*
- 9 - *Red warning light for too hot engine coolant.* (See engine coolant temperature indicator).
- 10- *Red warning light of immediate engine «STOP».* It comes on together with engine oil pressure warning light (2), tractor (7) and trailer (4) brake circuit oil pressure warning lights, hydraulic system low pressure warning light (6) and (8). If it comes on during work, ask your Dealer's specialized workshop for help.

Warning buzzer

The buzzer comes on whenever the red warning light for low pressure in hydraulic transmission system should come on. In this case, ask your Dealer's specialized workshop for help.

Instruments and controls

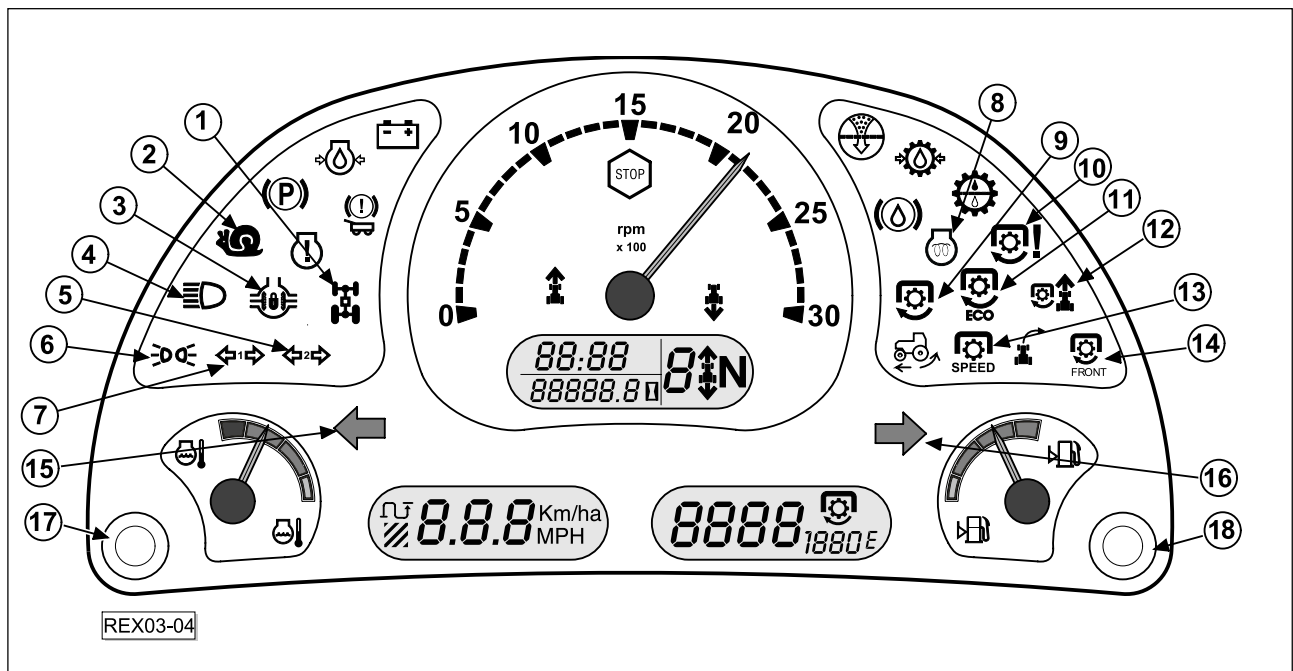


Fig. 3-9 Instrument panel

Instrument panel

Operation indicator lights (Fig.3-9)

- | | |
|--|--|
| 1 - 4WD engaged indicator – orange (if mounted). | 13- PTO speed selector lever engaged indicator - orange. |
| 2 - Creeper engaged indicator - orange (if mounted). | 14- Front PTO engaged indicator (if mounted) - orange. |
| 3 - Diff lock indicator - orange. | 15- Left turn indicator. |
| 4 - Main beam indicator – blue. | 16- Right turn indicator. |
| 5 - Direction indicator light for 2 nd trailer – green. | 17-18 Buttons for adjustments. |
| 6 - Side light indicator – green. | |
| 7 - Direction indicator light for 1 st trailer – green. | |
| 8- Glow plugs pre-heating indicator (if mounted) - orange. | |
| 9 - Rear independent PTO engaged indicator – orange. | |
| 10-Overspeed power take-off (only NAO markets). | |
| 11-Indicator of 540ECO RPM PTO engaged – orange. | |
| 12-Synchronized PTO engaged indicator – orange. (if mounted). | |

Instruments and controls

Digital instrument panel

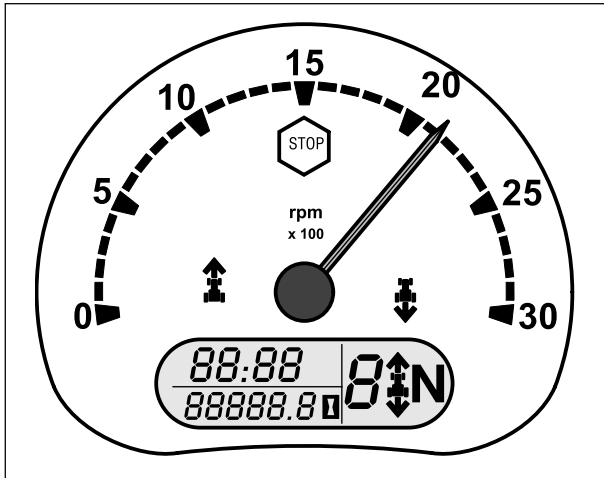


Fig.3-10

RPM meter and hour counter

The engine rate is displayed by a pointer on the outer graduated scale. The pointer should never reach the 2450 RPM zone which shows excessive engine speed.

Clock and hour counter

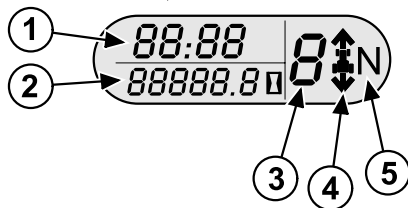


Fig. 3-11

Clock (1)

Hour setting
Minute setting

Hour counter (2)

The hour meter (2) in the lower part of the instrument shows the time actually worked, regardless of the engine speed rate.

- Hours are shown by 5 white digits.
- 1/10ths of an hour are shown by a yellow digit.

LCD - Fig.3-11 Top-Tronic

3 - Engaged Top-Tronic range indicator

- 1 = Reduced range - Underdrive
- 2 = Direct range
- 3 = High range

4 - Drive direction indicator

- ↑ = Forward gear indicator
- ↓ = Reverse gear indicator

5 - Top-Tronic indicator

- N = Top-Tronic engaged
- F = Forward speeds
- R = Reverse speeds
- P = Park Lock engaged

Power take-off speed indicator

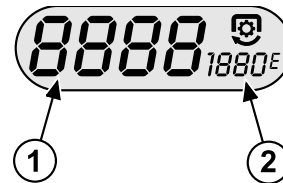


Fig. 3-12

The indicator (1) displays the operating rate of the PTO with great accuracy. The operating rate of implements for which the rotation speed must be precisely selected can therefore be kept under constant control. Speed indicator of the PTO engaged (2): 540RPM; 540ECO RPM; 1000RPM.

Speedometer - Digital panel

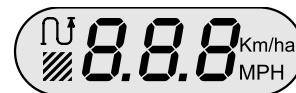


Fig. 3-13

The speedometer displays the ground speed of the tractor without considering wheel slip. The speed can be expressed in kph or mph, depending on the country in which the tractor is to be used.

NOTE: If the originally fitted tyres must be changed for special jobs, the speedometer can be re-programmed to suit the size of the new ones.

LCD - Fig.3-11 Powersix

3 - Engaged Powersix range indicator

- 1 = Reduced range - Underdrive
- 2 = Direct range
- 3 = High range

4 - Drive direction indicator

- ↑ = Forward gear indicator
- ↓ = Reverse gear indicator

5 - Reverseshuttle indicator

- N = Reverseshuttle engaged
- F = Forward speeds
- R = Reverse speeds

Instruments and controls

Engine coolant temperature gauge

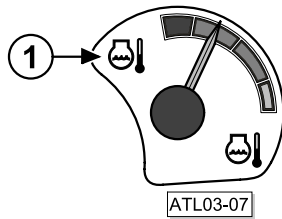


Fig. 3-14

- Green area = ambient temperature. Wait for the pointer to reach the green area, indicating the normal operating temperature.
- Green area = normal operating temperature.
- Red area = temperature too high.

The overheating warning light (1) comes on at 105-110°C (221-230°C). Possible causes of engine overheating:

- a. Low engine coolant level.
- b. Radiator caked with mud, dust, straw, etc.
- c. Build-up of deposits in coolant circuit.
- d. Loose fan belt.
- e. Faulty thermostat.

CAUTION: If the engine temperature is too high, let the engine idle immediately but do not switch it off. If the temperature gauge stays in the red, identify the cause immediately and seek expert advice if necessary.

Fuel level gauge

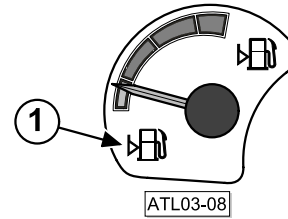


Fig.3-15

When the pointer moves into the yellow zone and the red reserve warning light (1) comes on, there are still about 10 liters of fuel in the tank.

Instruments and controls

Instrument adjustments

LCD1, LCD2, LCD3 indicate the 3 digital displays, while P1 and P2 are the left-hand and right-hand selection buttons, respectively (Fig.3-16).

When the instrument is off (ignition key on OFF) the LCD's 2 and 3 do not display anything, but LCD 1 displays the time.

Turning the ignition key from OFF to ON, an auto-check is performed by the instrument, by lighting up all indicators and characters of LCD 1, 2 and 3. After a few seconds, the instrument goes back to the default status, when the clock, the time worked and the drive direction in the Powershift range are displayed on LCD 1, the ground speed (in Kph or Mph according to the country) is displayed on LCD 2, and the PTO type and speed are displayed on LCD 3.

Turning the ignition key ON-OFF-ON, the instrument always goes back to the above mentioned default status.

By means of the buttons P1 and P2 the instrument can be adjusted in **Normal Mode** or **Parameter Setting Mode**.

Normal mode

Only LCD2

Every time the **P1** button is depressed (briefly), the **worked area (ha)** and the **covered distance (Km)** are displayed on LCD2 on the base of the ground speed (Kph)

Worked area

In the **worked area** position, depress (briefly) the **P2** button to activate the count of the worked area (the symbol shown in Fig.3-17 flashes 2 - 3 times in a second). Depress (briefly) the **P2** button once again to stop the count (the symbol is now steadily lighted).

Covered distance

In the **covered distance** position, depress (briefly) the **P2** button to activate the calculation of the covered distance (the symbol shown in Fig.3-18 flashes 2 - 3 times in a second). Depress (briefly) the **P2** button once again to stop the count (the symbol is now steadily lighted).

Keep the **P2** button depressed for more than 5 sec to reset such counts to zero.

Switch the ignition key ON-OFF-ON to return the instrument to the default status, without however losing the above mentioned counts.

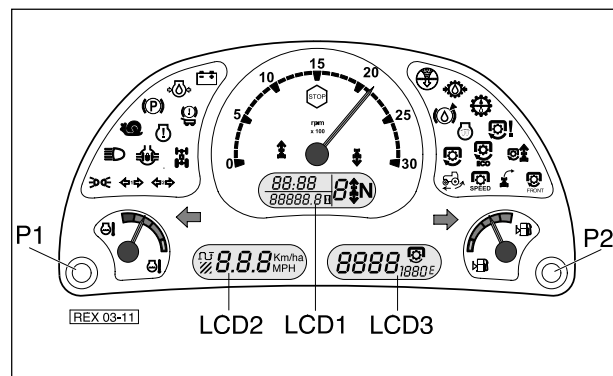


Fig.3-16

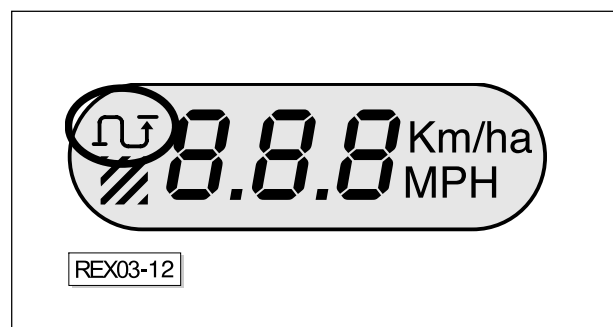


Fig.3-17

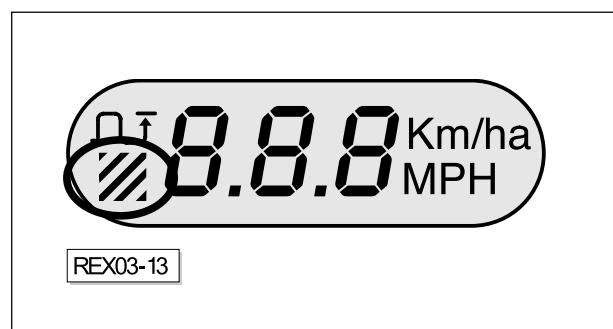


Fig.3-18

Instruments and controls

Parameter setting mode - LCD1, LCD2 and LCD3

With each pressure (longer than 5 sec) on the **P1** button, the set-up procedure for **implement dimensions**, **tyre type** and **clock** is displayed on LCD2, LCD3 and LCD1 respectively.

Implement dimensions

In the **implement dimensions** position (see Fig.3-19) by a brief pressure on the **P2** button it is possible to increase the flashing numbers to be set. Switch to the next number by a brief pressure on the **P1** button, then adjust the flashing value by means of the **P2** button. To save the set values, keep the **P1** pressed for more than 5 seconds, (thus switching to the next set-up procedure), or simply waiting for 10 seconds (all displays go back to the default status saving the previous settings)

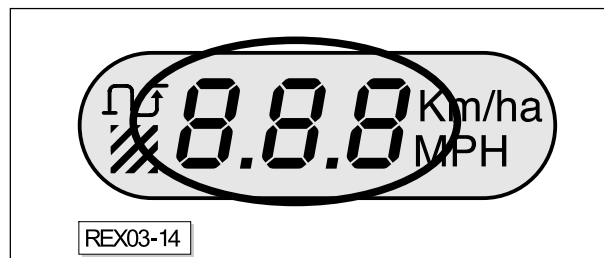


Fig.3-19

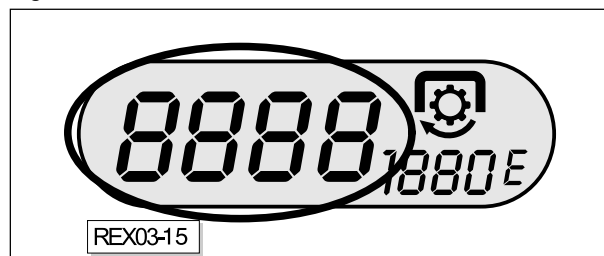


Fig.3-20

Rear tyre type - "N" see table Fig.3-21

In the **tyre type** position (see Fig.3-20) by a brief pressure on the **P2** button it is possible to increase the flashing numbers "N" to be set (Fig.3-21). Switch to the next number by a brief pressure on the **P1** button, then adjust the flashing value "N" (Fig.3-21) by means of the **P2** button.

To save the set values, keep the **P1** pressed for more than 5 seconds, (thus switching to the next set-up procedure), or simply waiting for 10 seconds (all displays go back to the default status saving the previous settings).

Clock

In the **clock** position (see Fig.3-22) by a brief pressure on the **P2** button it is possible to increase the flashing numbers to be set. Switch to the next number by a brief pressure on the **P1** button, then adjust the flashing value by means of the **P2** button.

To save the set values, keep the **P1** pressed for more than 5 seconds, (thus switching to the next set-up procedure), or simply waiting for 10 seconds (all displays go back to the default status saving the previous settings)

Switch the ignition key ON-OFF-ON to return the instrument to the default status, thus losing all the settings that had not been saved.

Rear tyres	R Index	N.
18.4 R 38	825	19
20.8 R 38	875	20
480/70 R 38	800	18
520/70 R 34	775	17
520/70 R 38	825	19
580/70 R 38	875	20
600/65 R 34	775	17
600/65 R 38	825	19
600/65 R 42	875	20
650/65 R 38	875	20

Table Fig.3-21

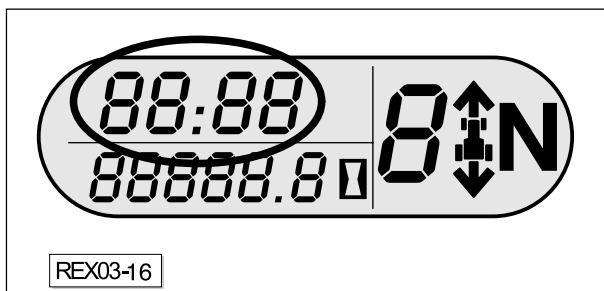


Fig.3-22

Instruments and controls

Cab

The cab is made of steel section metal and is fixed to the tractor by a double set of silent-block rubber dampers that insulate the driving seat from vibrations and engine noise. This allows the noise level to be kept at very low values (86 dBA), improving the conditions in which the operator works (Fig. 3-23).

Doors (5)

The doors can be opened from both the inside and outside and be kept in the open position by dampers. Both doors can be locked with a key.

Rear window (4)

To open the rear window, just turn the handle in an anticlockwise direction to release it and then push. Dampers will keep the window in the open position.

Side windows (6)

The side windows can be opened to the required extent. The articulated handle is used to open, close and regulate the opening angle of the windows.

Work lights

The cab can be equipped with additional front (1) and rear (3) work lights which notably increase the visibility during night work. The switches to operate the lights are on the cab roof (Fig. 3-25).

Rotating beacon

The rotating beacon is mounted on the rear part of the cab. It is operated by means of switch (2 - Fig. 3-5) on the dashboard.

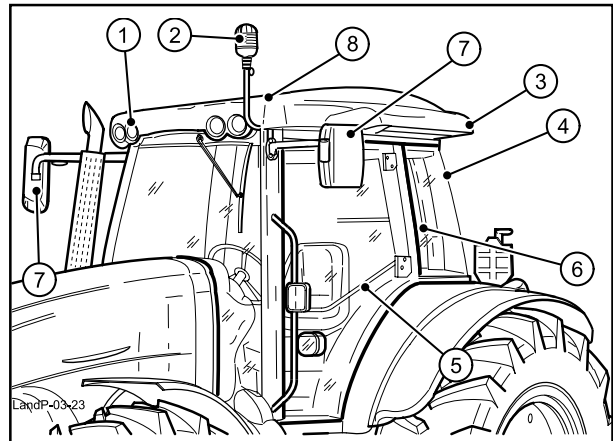


Fig. 3-23

Main cab components.

1 - Front work lights; 2 - Rotating beacon; 3 - Rear work lights; 4 - Rear window; 5 - Fully opening doors with safety lock; 6 - Opening side windows; 7 - Rear view mirrors; 8 - Opening roof.

Interior lights

Switch (1 - Fig. 3-24) is used to operate the interior lights. This switch has three positions:

To the left - Turns on the large interior light (3).

Center - Lights off.

To the right - Turns on the reading light (2).

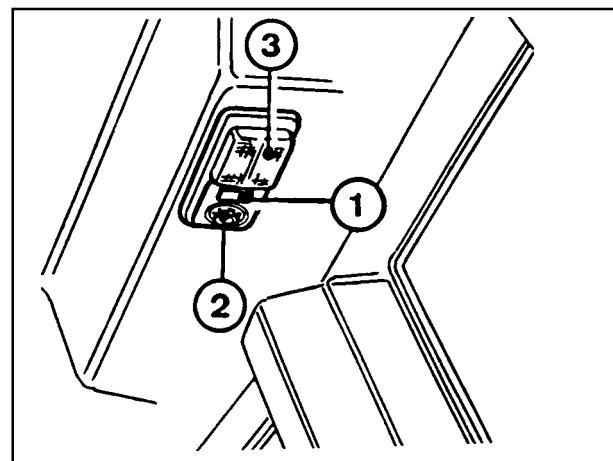


Fig. 3-24

Instruments and controls

Controls on cab roof

Fig. 3-26

- 1 - Three-position windscreen wiper switch: Stop - Intermittent - 1st Speed.
- 2 - Windscreen washer: press the switch to spray water to wash the windscreen.
- 3 - Rear window wiper switch.
0 - Off.
1 - Rear window wiper on.
2 - Window washer operation.
- 4 - Rear field light switch (with light switch on).
0 - Lights off.
1 - Two external rear lights on.
2 - All rear lights on.
- 5 - Front field light switch (with light switch on).
0 - Lights off.
1 - Two external front lights on.
2 - All front lights on.
- 6 - Air-conditioner controls.
- 7 - Handle to open roof.
- 8 - Watch.
- 9 - Interior lights

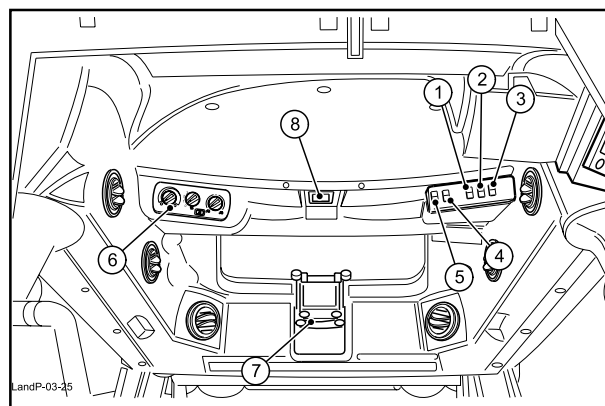


Fig. 3-25 Controls on cab roof

Instruments and controls

HEATING AND AIR CONDITIONING

The cab heating and ventilating controls are all located on cab roof. (Fig. 3-26).

Heating

Set the temperature adjuster knob (1) as required in the red area for heating (Fig. 3-26).

Select the speed of the electric fan with knob (2), to adjust the quantity of air let into the cab.

Use switch (3) to re-circulate the air and quickly heat the cab.

WARNING: Make sure that the air conditioning switch (6) is "OFF".

Air conditioning

NOTE: Make sure that the temperature control knob (1) is in the blue area.

Remember to set the air circulation switch (3) to the position 5 when the air conditioner is turned on.

- 1 - Make sure that all the doors and windows are shut and then press the A/C button (6 - Fig. 3-26).
- 2 - With the engine running, turn the temperature adjuster knob (1) to obtain faster cooling.
- 3 - Turn the fan control knob (2) fully clockwise and open the air vents (3 - Fig. 3-27) to obtain faster cooling.
Lower the fan speed once the required temperature has been reached.
- 4 - Adjust the temperature with the knob (1 - fig.3-26).

NOTE: If the air-conditioning system is operated at a low temperature for a long time, ice may form on the evaporator. If this happens, or if the automatic temperature control mechanism cuts out the system, adjust the temperature control to increase the temperature setting. If the problem persists, increase the fan speed.

- 5 - Adjust the fan speed to maintain comfortable operating conditions.

NOTE: Clean the cab air filter at the indicated times (see Maintenance chapter) and mount special filters when chemical products are used.

CAUTIONS:

The air conditioner will not operate when the engine is at a standstill as the compressor is operated by the engine itself.

Make sure that the air conditioner control is in the off position before starting the engine.



WARNING: If the tractor is to remain unused for a long period of time, or if the system is not used, remember to allow the air conditioner to operate for about 15 minutes each week. This precautionary measure prevents gas from leaking from the compressor.

Instruments and controls

Cab heating, air circulation and air conditioning controls in the cab - Fig. 3-26

1 - Temperature control knob.

Blue area - Cold air
Red area - Hot air

2 - Fan switch.

0 - OFF
1 - Slow
2 - Medium
3 - Fast

1 - Temperature control knob.

Blue area - Cold air
Red area - Hot air

3 - Switch to re-circulate the air in the cab or fresh air from outside.

4 - For fresh air from outside.

5 - To re-circulate the air in the cab.

6 - Air conditioner switch.

Press to turn on the air conditioning system.
Press again to turn off the air conditioning system.

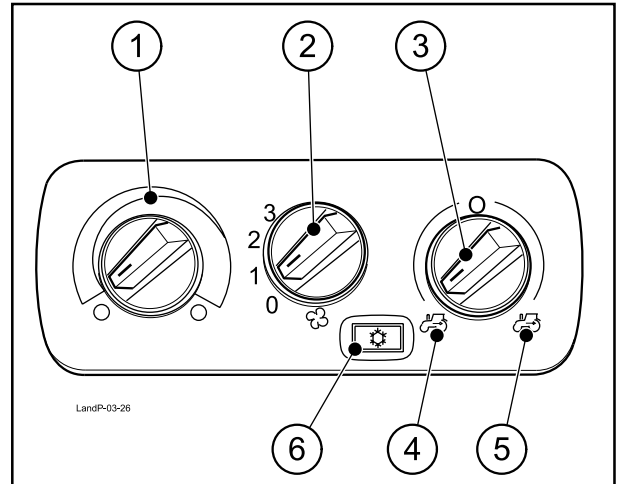


Fig. 3-26

3

Ventilation – Fig. 3-27

The cab ventilation is operated by means of 6 front air vents (3). Position the air flow in the required direction by turning the vents.

The air that flows into the cab can be drawn from either inside the cab or outside by means of the vents.

The control (1) allows the internal air of the cab to be recycled.

Internal air recycling in the cab

The rear vent (2) allow the internal air to be recycled.

- Open vent: a great quantity of air is sucked up from inside the cab by this vent and recycled through the air vents.
- Closed vent: air is sucked up from the outside into the cab after passing through the external filters.

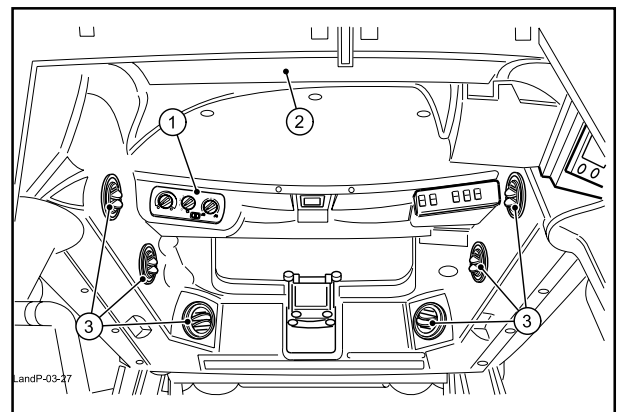


Fig. 3-26

CAUTION: Do not open the front, rear or side windows, nor any doors, during work. The noise inside the cab would increase to such an extent as to require the operator to wear ear muffs or other individual protection gear against noise.

Instruments and controls

Steering wheel adjustment

The steering wheel can be adjusted in height by unscrewing the knob (1 - Fig. 3-28). It can be tilted to suit the driver's requirements after having released the lever (2 - Fig. 3-28).

Seat

The driver's seat has devices to adjust the suspension, height and distance from the controls (Fig. 3-29).

Seat suspension

This can be modified to suit the driver's weight by means of the adjuster lever, which is easily accessible from the driver's seat (3 - Fig. 3-29).

Weight and height indicator (4 - Fig. 3-29)

Seat height adjustment

Use knob (2 - Fig. 3-29) to raise or lower the seat.

NOTE: *Pneumatic seat suspension, which is adjusted for height and distance in the same ways, is available in certain countries on request.*

Regulating the distance

The seat can be moved forwards or backwards by releasing the relative lever (7 - Fig. 3-29).

Backrest tilting (6).

Support in the lumbar region (5). Available on request.

Standard type seat with foldable arm rests, with adjustable distance (1 - Fig. 3-30) and adjustable suspension (2 - Fig. 3-30).

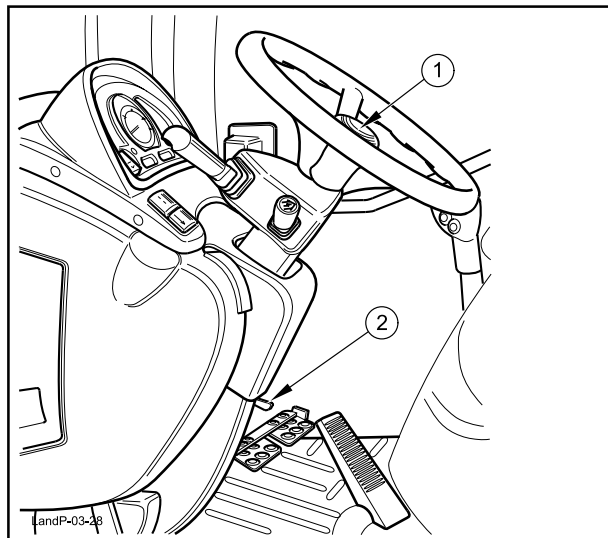


Fig.3-28

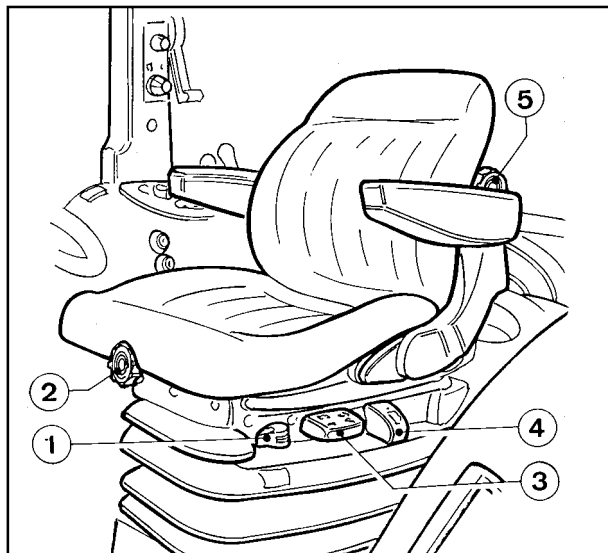


Fig.3-29

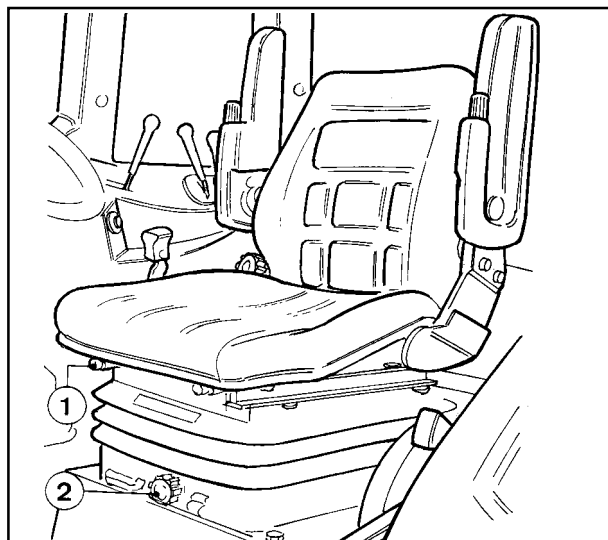


Fig.3-30

Instruments and controls

MISCELLANEOUS

Tool kit. A bag containing a set of tools and other materials for the tractor is mounted on the tractor.

Quick couplings (1 - Fig. 3-31). Quick couplings of the « Push-Pull» type for auxiliary spool valves are supplied for remote controls.

7-pin rear power socket for trailer (2 - Fig. 3-31)

Oil union for hydraulic trailer brakes (3 - Fig. 3-31).
(Available on request in certain markets).

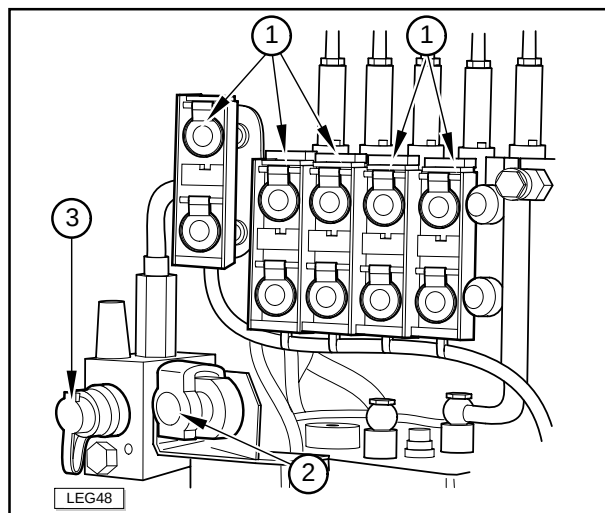


Fig. 3-31

Reservoir for windscreen wiper-washer fluid (1 - Fig. 3-32) and engine coolant recovery bowl (2).

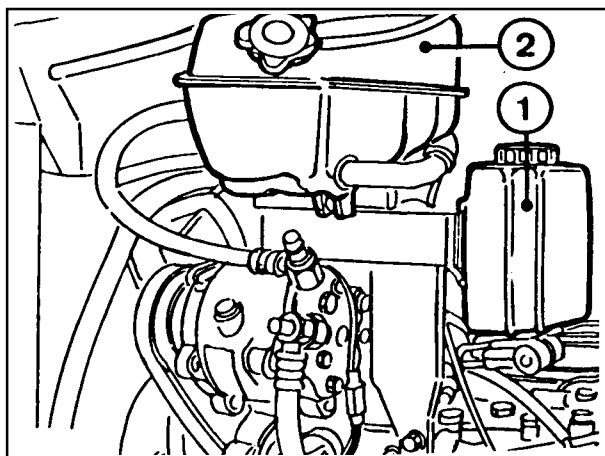


Fig. 3-32

Instruments and controls

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Chapter 4 Operation

4

Operation

OPERATION



WARNING: Carefully read the starting instructions on the two "Starting Instructions" decals, one affixed to the side where the driver climbs into the cab and the other on the windscreen in front of the driving seat.

ENGINE Starting the engine



WARNING: Make sure that the starting system allows the engine to start only when the reverse shuttle lever and PTO slow/fast selector lever are in the neutral position. If this fails to occur, have the tractor repaired by your dealer or authorized service center.

- A - Check that the reverse shuttle lever, the gearshift lever and the range selector lever are in neutral.
- B - Move the PTO slow/fast speed selector lever to neutral position.
- C - Move the hand throttle lever to about halfway position.
- D - Depress the clutch pedal all the way.

TURBO ENGINE: Allow the engine to run for a few seconds with the starter motor to allow the turbo compressor to be lubricated. Detach the contacts of the electric stop command on the injection pump to prevent the engine from starting. Restore the electrical circuit to its initial conditions. As soon as the engine starts, accelerate to a 1000-1200 RPM rate without increasing further until the engine has reached the normal operating temperature.

- E - Turn the ignition key to the "START" position. Release the key as soon as the engine fires and quickly set the accelerator lever to the idling speed of 1000 RPM.



WARNING: When the engine is running, keep at a safe distance from the radiator fan.



WARNING: To prevent accidents, never allow anyone to sit on the mudguards or on any other part of the tractor or implement.

Cold weather starting (temperatures below 0°C)(32°F)

CAUTION: When outdoor temperatures drop to around or below 0°C (32°F), check the cooling circuit and if necessary add the recommended antifreeze.

CAUTION: Do not inject fluids (ether) to make the engine easier to start in cold weather. The tractor is equipped with a cold weather starting system.

Proceed as follows:

- Perform operations a, b, c, d, as instructed above.
- Turn the ignition key to the pre-heat position and keep it there for 20 seconds, then turn the ignition key to the "START" position. If the engine fails to start within 15 seconds, return the key to the pre-heating position.
- Wait a further 10 seconds and then turn the ignition key to the "START" position again.
- As soon as the engine starts, release the key.
- If the engine fails to start, repeat the pre-heating or starting procedure as described above.

NOTE:

- If the engine fails to start after two or three attempts and smoke can be seen coming out of the exhaust, repeat the starting procedure without the thermostarter pre-heating phase.
- Do not keep the key turned to the start position for more than 15 seconds at a time.
- Wait at least 1 minute between one attempt at starting and another.

If the engine does not start regularly and easily, do not continue as for you may run down the battery. Bleed any air that may have accumulated in the fuel system and, if the problem persists, check that:

- the fuel filters are not blocked.
- the battery and thermostarter are efficient.
- the fuses of the ignition circuit are in good conditions and that the fuel shut-off valve is open (contact your dealer or a specialized workshop).

NOTE: Before starting a cold engine in cold weather, first cover the radiator with a radiator cover. Remove the cover as soon as a normal working temperature has been reached.

Running in

It is essential to take the following precautions during the running in period:

- 1 - Experience has shown that the first 50 hours of use are of fundamental importance for the subsequent performance and working life of the engine. During this period, do not subject the tractor to loads greater than those it will have to deal with during the rest of its working life.
- 2 - Engage low gears when towing heavy loads.
- 3 - When running in, check regularly that all screws, nuts and bolts are tight.
- 4 - To ensure prolonged clutch life, run in the clutch discs correctly.

NOTE: Use the clutch frequently but carefully during the first 15 hours of use.

Starting the tractor



WARNING: Before moving off, make sure you are perfectly familiar with the brakes, transmission, PTO, diff lock and engine shut off.

After starting the engine:

- 1 - Fully depress the clutch pedal, select the gear required and then select the speed range.



WARNING: Make sure that the reverse shuttle lever is set for the direction required.

- 2 - Release the parking brake.



WARNING: Take care of bystanders, especially when backing up.

- 3 - Accelerate the engine slightly and gradually release the gearshift clutch pedal.
- 4 - Move your foot completely off the clutch pedal and slowly accelerate until you have reached the speed you need.

CAUTION: Do not keep your foot on the gearshift clutch pedal when driving and remember to check and adjust the clutch to prolong its life and avoid sudden damage to it.

CAUTION: If your tractor is equipped with a mechanical reverse shuttle, always bring the tractor to a complete standstill before changing direction.

Accelerator pedal

The accelerator pedal can over-ride the setting of the hand throttle lever to accelerate the engine. However, when you release the pedal, the engine returns to the speed set by the hand lever. When using the accelerator pedal, always set the hand throttle lever to the idling position.

Stopping the tractor

- Reduce the engine speed.
- Depress the gearshift clutch pedal to disengage drive.
- Once the tractor has come to a stop, move the gear lever and speed range lever to neutral before releasing the gearshift clutch pedal.
- Use both pedal brakes to stop the tractor and then apply the parking brake.

Turning off the engine

- Turn the hand throttle lever to the "Idling" position.
- Stop the engine by turning the ignition key to the STOP position to disconnect all electrical circuits.

TURBO ENGINE: Take care when stopping the engine after a period of operation at full load. It is advisable to allow it to idle for 3 or 4 minutes before stopping it. This allows the overheated turbo-compressor to cool to an acceptable temperature.

Operation

Cruise Control

The electronic controlled engine is provided with a Cruise Control. It makes it possible to preset and keep a steady ground speed or PTO RPM rate (within given values) independently of load variations. On headlands or to have a break during work, the operator only needs to press the Trip 1/Trip 2 button to set the engine on idling or on any other speed previously set by means of the hand throttle. If the operator presses the Trip 1/Trip 2 button again, the speed used before the break is resumed.

1 - Cruise Control ON/OFF.

Cruise Control engagement switch (on the right hand post of the cab)
To engage Cruise Control when depressed.
Depress the brake pedals to disengage the Cruise Control.
The Resume button (2A) engages the Cruise Control again at the value set with the SET button (2B).

2 –SET/DECEL & RES/ACCEL button

To slow down or accelerate the engine by hand or preset and recall the two Cruise Control speeds (on the right hand post of the cab).

2A-RES/ACCEL function = RESUME/ACCELERATE

If the Cruise Control is activated, this button increases the engine speed at increments of about 20 RPM each time it is depressed.
If the Cruise Control is deactivated, this button does not operate.
The Cruise Control is deactivated by depressing the brake pedals, and can be restored by means of this button RES-Resume (2A).

2B-SET/DECEL function = SET/DECELERATE

- If depressed when the Cruise Control is activated, this button increases the engine speed at increments of about 20 RPM each time it is depressed.
- To change the preset value of SET, the engine RPM rate must be changed by accelerator pedal (or hand throttle), then the SET button (SET function) depressed again. The engine RPM rate is set as Trip 1/ Trip 2, according to the position determined by the Trip 1/ Trip 2 button (4).

3 –ENGINE INDICATOR LIGHTS

3C - Red: Engine stop
- Steady light: Engine oil at minimum level Top up to maximum level with oil of prescribed type.
- Blinking light: Danger, serious fault. Stop the engine immediately and ask an authorized service point for repair.
3D - Orange: Warning and engine diagnostics light. Le blinking rate gives the fault code to report to the personnel of the authorized service point.

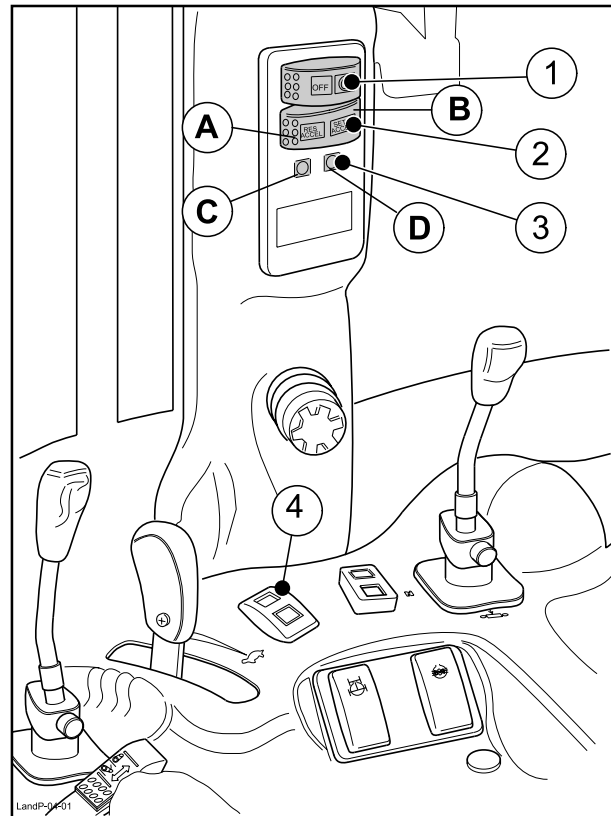


Fig. 4-1

4 –Trip 1/ Trip 2 switch

Selects one of two speeds preset by means of the SET button (2B).

Trip 1 - To set Trip 1 speed, engage the Cruise Control and depress the button on the Trip 1 side, then push the SET button (2B): the current speed is set as Trip 1.

Trip 2 - To set Trip 2 speed, engage the Cruise Control and depress the button on the Trip 2 side, then push the SET button (2B): the current speed is set as Trip 2.

With the Cruise Control activated, depress the switch on the side corresponding to the speed you want to select to recall one of the two speeds Trip 1/Trip 2.

Landpower 145-165 Dual Power

The Dual Power system increases the available power when working under load with engaged PTO. Dual Power uses all the possibilities offered by the electronic control of the engine, to ensure a steady power even when load changes. When working with the PTO, it automatically gives an extra power of 7 kW/9 HP for Landpower 145 and 165, thus allowing a better use of the PTO and better performances.

Dualpower	Power ISO	Extra Power	Increase
145 Dualpower	107 kW	114 kW	+ 7 kW
165 Dualpower	120 kW	126,9 kW	+ 6,9 kW

Clutch

Gearshift clutch pedal (Fig. 4-2).

- Pos. 1 up = drive engaged.
- Pos. 2 down = drive disengaged.

Make your gear changes gradually. When the engine is under load, do not slip the clutch to accelerate, but change to a lower gear.



WARNING:

- *Never keep your foot resting on the gearshift clutch pedal when driving.*
- *Never coast down slopes with the gear lever in neutral.*

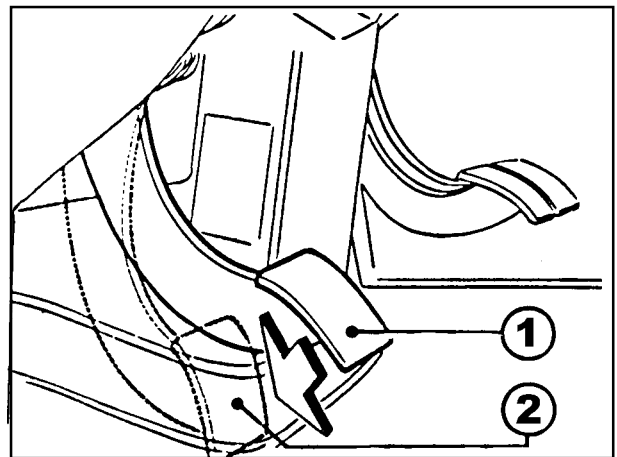


Fig. 4-2

Operation

Gearbox

The gearbox is available with a number of options to meet specific needs.

Techno

Standard "Speedsix" gearbox with reverse shuttle:

This is the basic version with six synchronized gears in three speed ranges (Low - Standard - High) and gives 18 forward speeds and 18 reverse speeds with the synchronized reverse shuttle.

The sixth gear cannot be engaged in the high range in the 30 kph (18.7 mph) max. version (only available in certain markets), thus the available speeds are: 17 forward and 17 reverse speeds.

The other available options are:

Creeper: Reduces all the speeds of the standard gearbox by 80% (ratio 5:1), obtaining 36 forward speeds and 36 reverse speeds.

Top

Powersix: Electro-hydraulic engagement allowing all the speeds of the standard gearbox to be reduced by 17%, thus obtaining 36 forward speeds and 36 reverse speeds (Legend Top only).

Powersix and Creeper: Installed along with the standard Speedsix gearbox to obtain 72 forward speeds and 72 reverse speeds (Legend Top only).

Top-Tronic

Top Tronic: Electro-hydraulic engagement of three speed ranges, electro-hydraulic reverse shuttle and creeper, to obtain 108 forward speeds and 36 reverse speeds.

Gearbox Gearshift levers.

Fig. 4-3 - Top

- 1 - Gearshift lever.
- 2 - Speed range selector lever.
- 3 - Powersix button on the right-hand console.
- 4 - Powersix button on the knob of the gearshift lever.

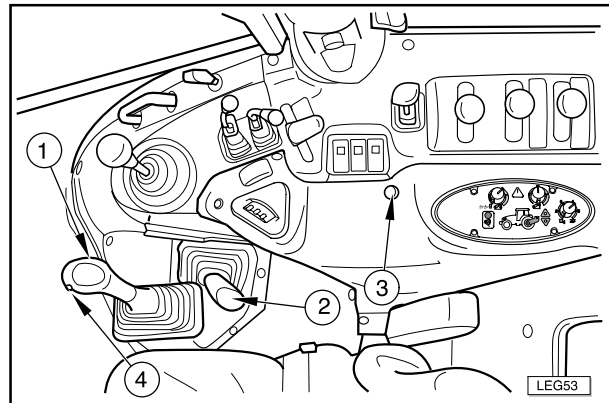


Fig. 4-3

Gear lever

The lever has six different positions. All six gears are fully synchronized.

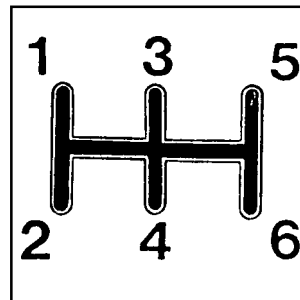


Fig. 4-4
Six lever positions
equivalent to six
ground speeds.

To change from one gear to another within the same speed range, simply depress the gearshift clutch pedal and move the gear lever to its new position. There is no need to stop the tractor.

Speed range selector lever

The speed range selector lever has three possible positions corresponding to the low, standard and high speed ranges (Fig. 4-5). Each speed range is identified by a symbol on the knob of the lever.

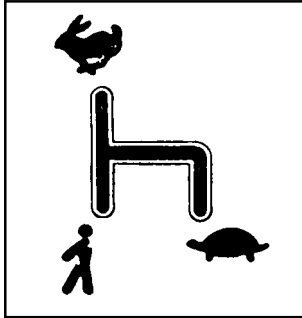


Fig. 4-5
Gating layout of the speed range selector lever showing the three speed ranges



Low range



Standard range



High range

To change from one speed range to another, disengage the gearshift clutch pedal, bring the tractor to a complete standstill before moving the speed range selector to its new position.

Creeper control lever

Fig. 4-7

* Optional extra

To engage or disengage the creeper range, depress the gearshift clutch, bring the tractor to a complete standstill and then move the creeper lever to the desired position.



The standard speeds of the gearbox are engaged.

N

Neutral position.



Ultra-slow speeds, 80% lower than the standard speeds, are engaged.

The Creeper should only be used in the Low Range.

Synchro reverse shuttle lever Techno - Top - Fig. 4-6

To engage the forward or reverse gears, you must depress the gearshift clutch pedal, stop the tractor and then select the required reverse shuttle lever position. You must do this even if the gears are synchronized.

A - Forward gears.

N - Neutral.

R - Reverse gears.

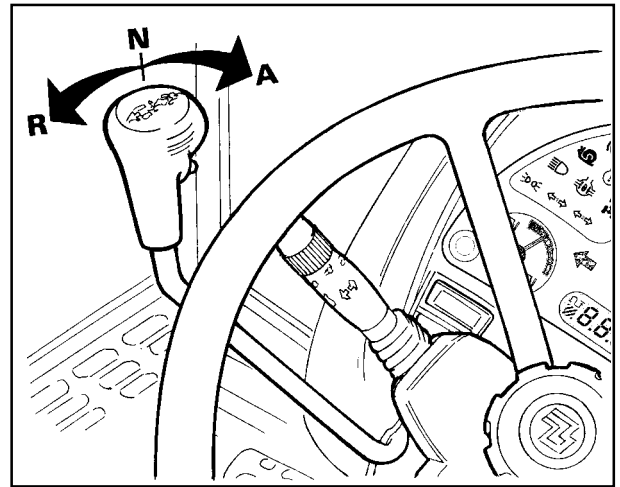


Fig. 4-6

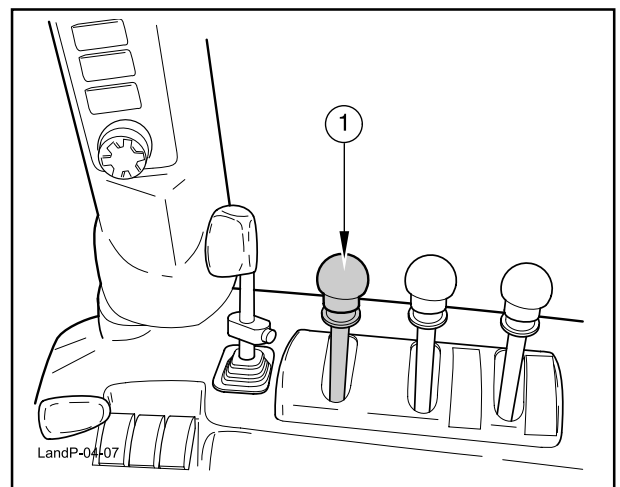


Fig. 4-7

Operation

Powersix

Powersix is an electro-hydraulic device that allows a low gear to be engaged for all the available gearbox speeds.

Powersix is engaged whilst the tractor is on the move, without having to disengage the main clutch. Just press the button (Fig. 4-8) on the speed selector lever or the yellow button (4 - Fig. 4-10) on the right-hand console.

Low Range:	reduces any gear engaged by 17%.
High Range:	increases any gear previously engaged in Low Range by 20%.

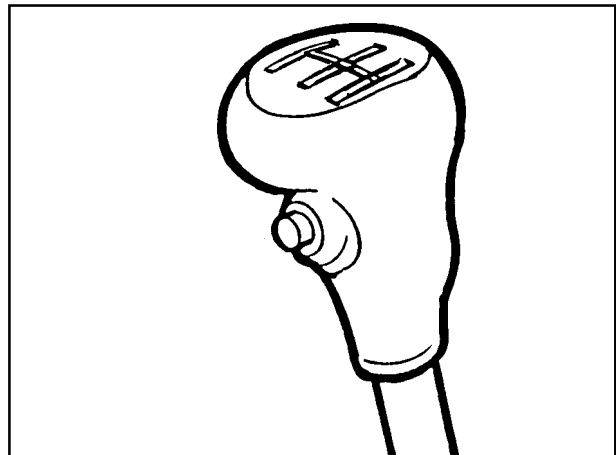


Fig. 4-8 - Top - Powersix

Indicator light with Powersix

Two arrow-shaped lights on the instrument panel show the drive direction (Fig.4-9).

- 1 - Forward gears (green)
- 2 - Reverse gears (orange)
- 3 - Powersix range indicator light
 - 1 = Reduced range - Underdrive
 - 2 = Direct range
 - 3 = High Range
- 4 - Reverse shuttle range indicator light
 - F = Forward
 - N = Neutral - Reverse shuttle in neutral
 - R = Reverse

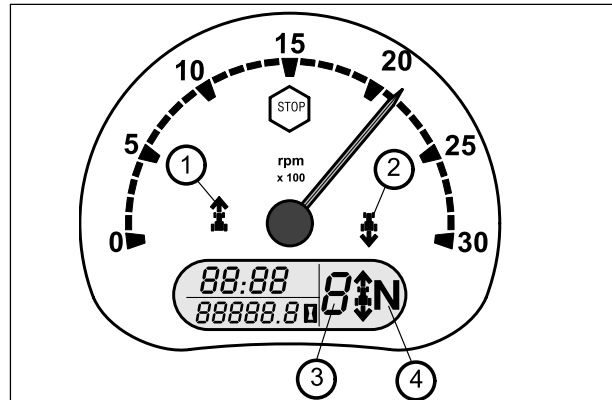


Fig. 4- 9

Using the gearbox and choosing the correct speed Powersix

Correct ground speed depends on the type of work in hand, the type of implement being used and the type of terrain.

Always choose a gear that enables the engine to work at 75% of its maximum speed so that any extra workload can be absorbed by the engine.

How to choose the correct ground speed - Fig.4-10

- 1 - Decide whether to work with the creeper range engaged or with the standard speed range (if the Creeper option is fitted) (3).
- 2 - Select the speed range which is most suited to the type of work you are doing (Low - Standard - High) (2).
- 3 - Choose one of the six synchronized gears (1).
By means of the Powersix button (5) or the yellow button (4) a total of 12 speeds is available for each range (Low - Standard - High): the six synchronized speeds of the standard Speedsix gearbox plus six half-speeds reduced by 17% thanks to the Powersix button.
- 4 - The synchronized reverse shuttle makes gear changing easy and simplifies row-end manoeuvres and work with the front loader.

NOTE: *The ground speeds given by the various gears and ranges are listed in the "Technical Specifications" at the end of this manual.*

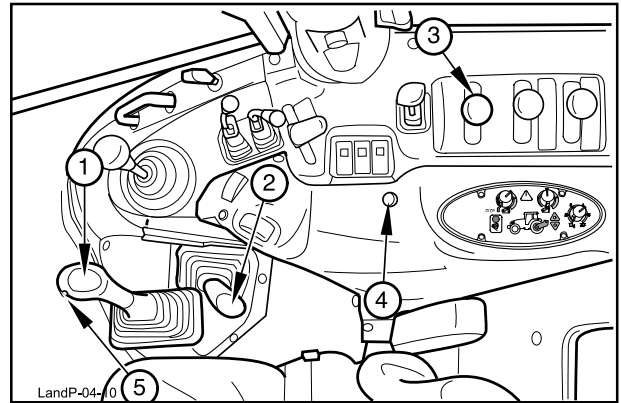


Fig. 4-10 - Top - Powersix

Operation

Top-Tronic gearbox

Top-Tronic is a transmission unit installed between engine and gearbox. It is controlled by an electro-hydraulic system and is made up of the following main groups:

- A mechanical unit, including two hydraulic multi-disc wet clutches, a main shaft, a transmission shaft, a third shaft for the reverse shuttle, three gear couples with relative synchromeshes and control mechanism.
- Hydraulic block provided with five solenoids: three are of the ON/OFF type and two proportional.
- Electronic control unit.

What is Top-Tronic for?

Top-Tronic was developed for greater comfort in gearbox use and to better performances thanks to its special functions, while reducing consumptions and obtaining a higher machine output. The electronic control unit also assures greater safety for the operator and better protection for the transmission components.

Available speeds

The standard gearbox has 18 speeds, as follows: 6 synchronized speeds for the three ranges Low - Standard - High.

The **Top-Tronic** transmission, together with the standard gearbox and the creeper, provides a total of 108 forward speeds and 36 reverse speeds.

Speeds without creeper

- Underdrive: 18 speeds (6x3) reduced by 20% from 1.5 to 34 Kph
- Direct drive: 18 synchronized standard speeds (6x3) from 1.8 to 40 Kph
- Overdrive: 18 fast gears (6x3), increased by 20% from 2 to 40 Kph. The overdrive is automatically excluded and the direct drive engaged for 40 Kph speed limit.
- Reverse: 18 standard reverse gears (6x3) from 1.9 to 40 Kph.

Speeds with creeper

- Creeper: adds further 54 forward speeds from 0.2 to 6 Kph and 18 reverse speeds.

The Creeper should only be used in the Low Range.

Main Top-Tronic functions

The **Top-Tronic** unit has the following main functions.

- Use of mechanical gearbox in all three modes: direct drive - overdrive - underdrive.
In direct drive mode, use of every single gear; in overdrive mode, mechanical ratio increased of 20%, and thus greater speed; in underdrive mode, mechanical ratio reduced of 20%, and thus greater torque.
It is possible to switch mode under load, without using the clutch pedal and with the tractor on the move, thanks to the two green buttons on the gearshift lever: button "+" to increase speed, button "-" to reduce speed.

- The Declutch system disengages the main hydraulic clutch by means of the button on the actual gearshift lever. With this button the driver can change mechanical gears without using the clutch pedal.

The clutch pedal is only used for very small movements of the tractor, e.g. to hitch or unhitch an implement, and for greater safety, when sudden stops are made or obstacles are encountered.

- Reverse shuttle under load: Allows the driving direction to be reversed by simply moving the small lever on the left hand near the steering wheel. The electronic control unit guarantees smooth and gradual reversing. For safety reasons, the direction can only be reversed at speeds of less than 8 Kph.

CAUTION: Reversing can be obtained at any speed. However, to protect mechanical parts from damage, this operation should be made ONLY at speeds UNDER 10 Kph. A buzzer sounds to warn from reversing at speeds over 10 Kph. To correctly engage the reverse shuttle, reduce your speed to under 10 Kph.

Operation

The Creeper should only be used in the Low Range.

NOTE: for mph multiply kph by .621

Landpower 125 - 135				
Top-Tronic with CREEPER - Speed in kph				
18.4 R38; 520/70 R38; 600/65 R38 tyres				
Gear	UNDERDRIVE with CREEPER	DIRECT DRIVE with CREEPER	OVERDRIVE* with CREEPER	REVERSE with CREEPER
1st Low	0.295	0.35	0.43	0.36
2nd Low	0.380	0.45	0.55	0.47
3rd Low	0.492	0.59	0.71	0.61
4th Low	0.633	0.76	0.92	0.78
5th Low	0.815	0.98	1.18	1.00
6th Low	1.082	1.30	1.57	1.33
1st Std	0.732	0.88	1.063	0.90
2nd Std	0.944	1.13	1.371	1.16
3rd Std	1.222	1.46	1.786	1.50
4th Std	1.573	1.88	2.297	1.93
5th Std	2.025	2.43	2.943	2.49
6th Std	2.696	3.22	3.90	3.30
1st High	1.731	2.07	2.51	2.13
2nd High	2.232	2.67	3.24	2.74
3rd High	2.890	3.46	4.20	3.56
4th High	3.721	4.46	5.41	4.58
5th High	4.799	5.74	6.96	5.89
6th High	6.354	7.61	9.23	7.82

* The overdrive is automatically excluded and the direct drive engaged for 40 Kph speed limit

Landpower 125 - 135				
Top-Tronic Speed in kph				
18.4 R38; 520/70 R38; 600/65 R38 tyres				
Gear	UNDERDRIVE	DIRECT DRIVE	OVERDRIVE*	REVERSE
1st Low	1.58	1.89	2.29	1.94
2nd Low	2.03	2.44	2.96	2.50
3rd Low	2.63	3.16	3.83	3.24
4th Low	3.39	4.07	4.93	4.18
5th Low	4.37	5.23	6.35	5.37
6th Low	5.79	6.94	8.42	7.13
1st Std	3.92	4.70	5.70	4.82
2nd Std	5.05	6.06	7.35	6.22
3rd Std	6.55	7.84	9.51	8.06
4th Std	8.43	10.10	12.25	10.36
5th Std	10.85	13.00	15.77	13.34
6th Std	14.39	17.25	20.92	17.70
1st High	9.27	11.11	13.47	11.40
2nd High	11.96	14.33	17.38	14.71
3rd High	15.48	18.55	22.50	19.05
4th High	19.94	23.89	28.98	24.52
5th High	25.66	30.75	37.29	31.56
6th High	34.04	40.79	47.98*	41.87

* The overdrive is automatically excluded and the direct drive engaged for 40 Kph speed limit

Landpower 145 - 165 - 185				
Top-Tronic with CREEPER - Speed in kph				
20.8 R38; 580/70 R38; 650/65 R38 tyres				
Gear	UNDERDRIVE with CREEPER	DIRECT DRIVE with CREEPER	OVERDRIVE* with CREEPER	REVERSE with CREEPER
1st Low	0.28	0.34	0.41	0.35
2nd Low	0.37	0.44	0.53	0.45
3rd Low	0.48	0.57	0.69	0.59
4th Low	0.61	0.74	0.89	0.75
5th Low	0.79	0.95	1.14	0.97
6th Low	1.05	1.25	1.52	1.29
1st Std	0.71	0.85	1.03	0.87
2nd Std	0.91	1.09	1.32	1.12
3rd Std	1.18	1.42	1.71	1.46
4th Std	1.52	1.83	2.21	1.88
5th Std	1.96	2.35	2.85	2.41
6th Std	2.60	3.12	3.78	3.20
1st High	1.68	2.01	2.43	2.06
2nd High	2.16	2.59	3.14	2.66
3rd High	2.80	3.35	4.07	3.45
4th High	3.60	4.32	5.24	4.44
5th High	4.64	5.56	6.74	5.71
6th High	6.15	7.37	8.94	7.57

* The overdrive is automatically excluded and the direct drive engaged for 40 Kph speed limit

Landpower 145 - 165 - 185				
Top-Tronic Speed in kph				
20.8 R38; 580/70 R38; 650/65 R38 tyres				
Gear	UNDERDRIVE	DIRECT DRIVE	OVERDRIVE*	REVERSE
1st Low	1.53	1.83	2.22	1.88
2nd Low	1.97	2.36	2.86	2.43
3rd Low	2.55	3.06	3.71	3.14
4th Low	3.29	3.94	4.78	4.05
5th Low	4.23	5.07	6.15	5.21
6th Low	5.61	6.72	8.15	6.91
1st Std	3.80	4.55	5.52	4.67
2nd Std	4.89	5.86	7.11	6.03
3rd Std	6.34	7.59	9.21	7.81
4th Std	8.16	9.78	11.86	10.05
5th Std	10.50	12.59	15.26	12.94
6th Std	13.93	16.70	20.25	17.16
1st High	8.98	10.76	13.05	11.06
2nd High	11.58	13.87	16.83	14.26
3rd High	14.99	17.96	21.79	18.46
4th High	19.30	23.13	28.06	23.77
5th High	24.84	29.77	36.11	30.60
6th High	32.96	39.49	47.90*	40.59

* The overdrive is automatically excluded and the direct drive engaged for 40 Kph speed limit

Operation

Top-Tronic controls (Fig. 4-11)

Selector levers

1 - Gear selector lever.

Top-Tronic control buttons and range indicator lights.

- 3 : Clutch disengaged (orange).
- +: +20% speed increase (green).
- : -20% speed decrease (green).

Indicator light of the Top-Tronic range (Fig.4-12).

2 - Range selector lever: Low, Standard and High.

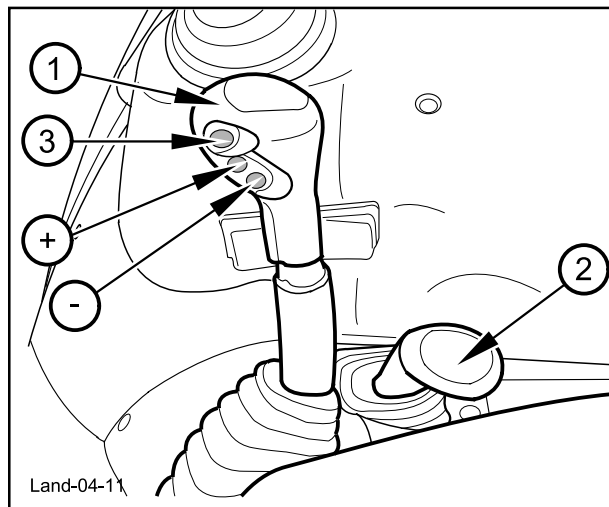


Fig. 4-11

Indications on the instruments - Top- Tronic (Fig.4-12)

- 1 - Forward gears (green)
- 2 - Reverse gears (green)
- 3 - Top-Tronic range engaged
 - 1 = Reduced range - Underdrive
 - 2 = Direct range
 - 3 = High range
- 4 - N = Top-Tronic in neutral
F = Top-Tronic in forward gears
R = Reverse
P = Park Lock engaged

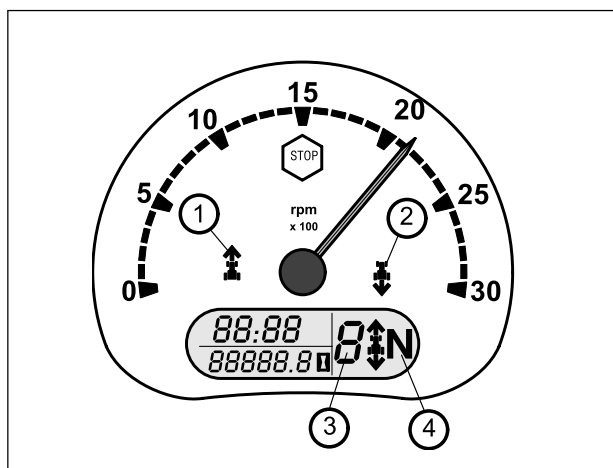


Fig. 4-12

Electro-hydraulic reverse shuttle lever

(Fig. 4-13)

Reversing while the tractor is moving

AV - Lever forward: Forward gears.

N - Neutral: Always move the lever to this position to start the engine.

RV - Lever back: Reverse Gears.

Two arrow-shaped lights on the instrument panel show the drive direction (Fig.4-12).

CAUTION: Reversing can be obtained at any speed. However, to protect mechanical parts from damage, this operation should be made **ONLY** at speeds **UNDER 10 Kph**. A buzzer sounds to warn from reversing at speeds over 10 Kph. To correctly engege the reverse shuttle, reduce your speed to under 10 Kph.

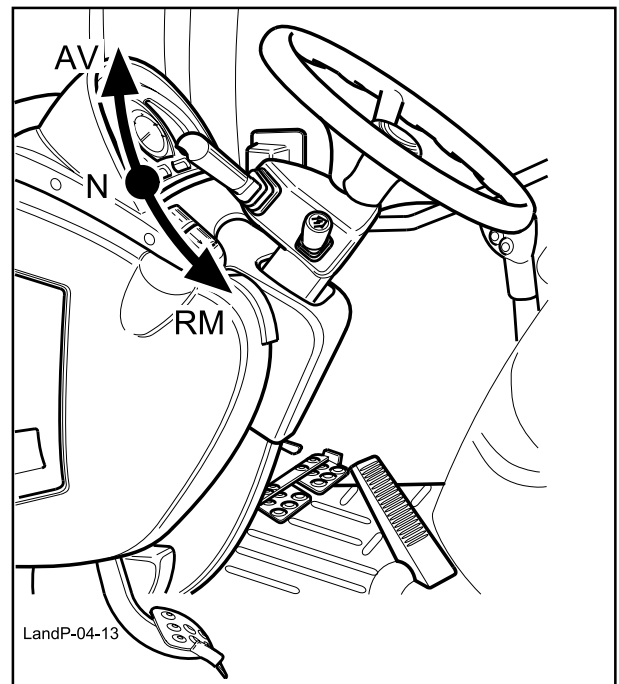


Fig. 4-13

Creep control lever

(Fig. 4-14)

When the creeper (1) is engaged, the yellow indicator light on the instrument panel comes on.

The Creeper should only be used in the Low Range.

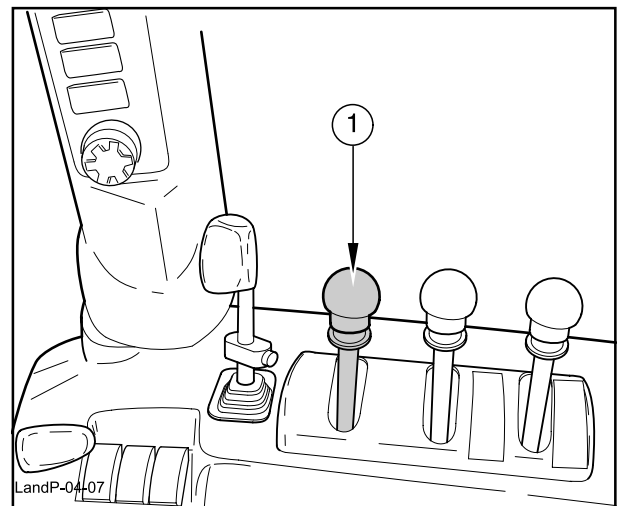


Fig. 4-14

Operation

Use of Deltashift gearbox

Starting the engine

Put in neutral:

1. Orange coloured shuttle control lever at the left of the steering wheel (Fig. 4-15).
2. Yellow coloured PTO switch on the cab right-hand post.
3. Turn the ignition key clockwise to position 1 (contact), then to position 3 (engine starting).

Forward starting

WARNING: To start the tractor when the weather is particularly cold, it is advisable to heat the transmission oil by running the engine until it reaches a temperature of 20°C. This ensures that Deltashift is able to operate correctly. During the first few minutes of work with the tractor, only change gear with Deltashift when strictly necessary until the normal operating temperature has been reached.

- After engine ignition, select the range (Low, Standard or High) with the relative lever according to the job on hand.
- Engage the required gear.
- Shift lever 1 (Fig. 4-14) to engage the creeper.
- Move forward the orange shuttle control lever at the left of the steering wheel.
Thus the tractor moves automatically forward without using the clutch pedal.

Reverse starting

Proceed as described above, only moving the shuttle lever back.

The tractor automatically starts in reverse.

Starting with the clutch pedal (Fig. 4-16)

The clutch pedal should only be used for precision approaches and manoeuvres.

1. Depress the clutch pedal (2) completely.
 2. Move the reverse shuttle lever (1) forward or backwards.
 3. Gradually release the pedal to control the tractor movement as necessary.
- Starting with Deltashift is usually in direct drive mode. Press the relative buttons on the control lever handle to start the tractor in underdrive or overdrive modes.

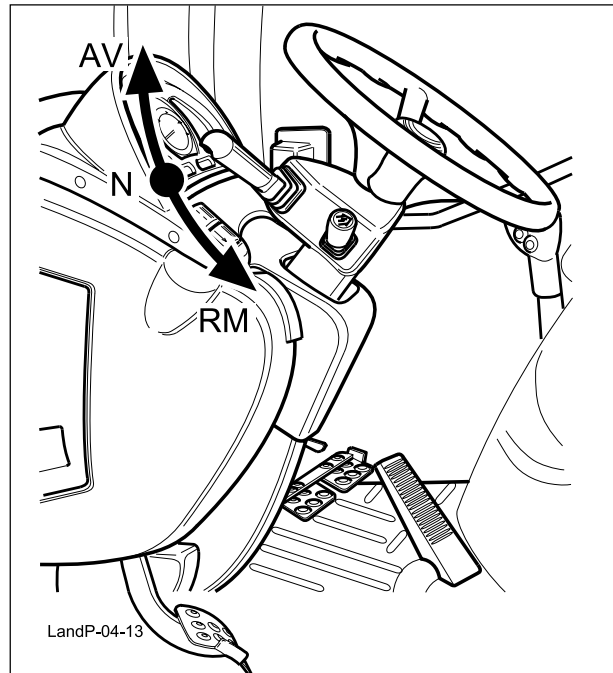


Fig. 4-15

Clutch pedal (Fig. 4-16)

The clutch pedal (2) is only used for:

- Safety manoeuvres, sudden obstacles, etc.
- Precision approaches, such as implement hitching.
- When the clutch pedal is depressed to select the gear, the Top-Tronic gearbox remains in the previously engaged range (Overdrive, Direct Drive, Underdrive).

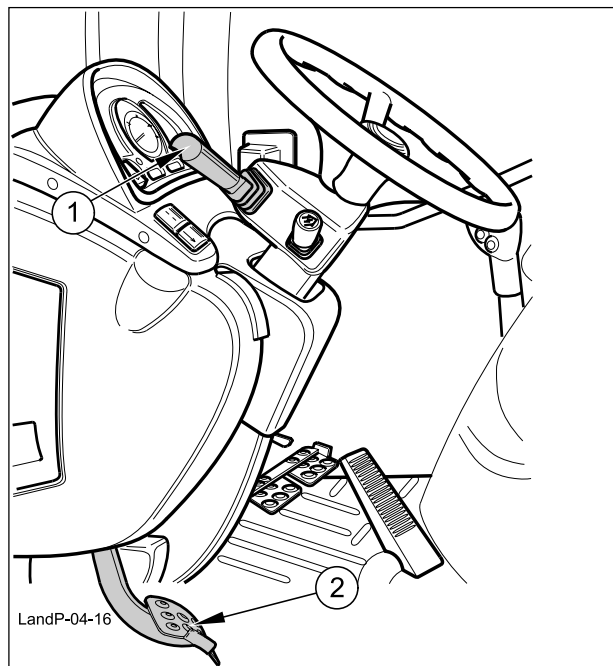


Fig. 4-16

Declutch button (Fig. 4-17)

The Declutch system allows the gear to be changed by pressing the relative orange button on the gearshift lever handle.

Changing gear with the Declutch system.

The Declutch button (Fig. 4-17) practically acts as the clutch pedal.

Press the button to disengage the hydraulic clutch, and keep it depressed while engaging the required gear. Release the button.

Every time the clutch is disengaged by the Declutch button, the gearbox goes into direct drive mode. The respective buttons +/- must be pressed to switch back to overdrive or underdrive.

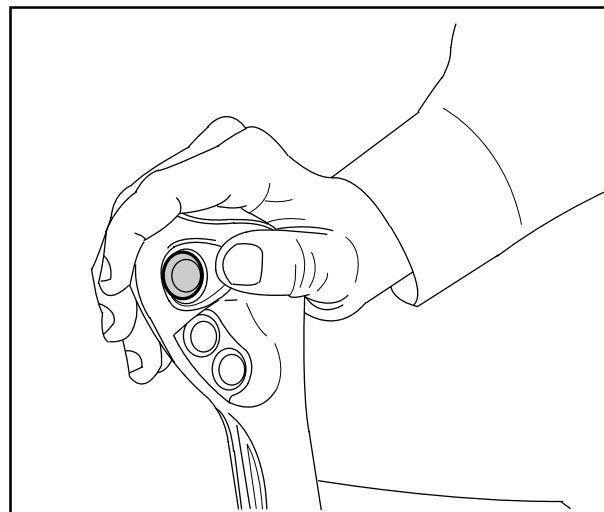


Fig. 4-17

Gear change with the clutch pedal (2- Fig. 4-18)

When the clutch pedal is depressed to change gear, Deltashift remains in the range previously engaged (overdrive, direct drive, underdrive)

Changing the range (low, standard, high) with the clutch pedal

Depress the clutch pedal and wait for the tractor to stop before selecting a range (low - standard - high).

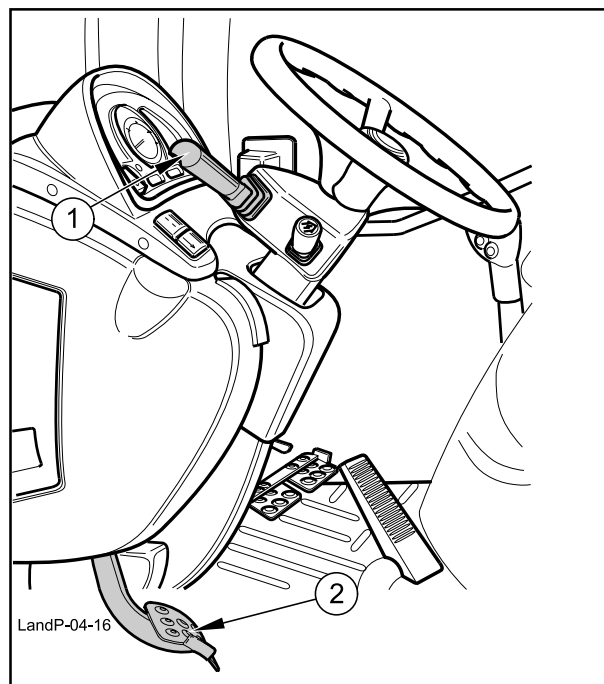


Fig. 4-18

Operation

Choosing underdrive/overdrive under load

The Top-Tronic system provides the overdrive and underdrive ranges with respectively +20% and -20% of the power available in the direct drive mode. For instance, if the 4th gear is engaged, the following speeds are available: 4th gear in direct drive; 4th gear in overdrive +20%; 4th gear in underdrive -20%.

To select the overdrive range, press the upper green button "+" on the gearshift lever: changes from direct drive to overdrive and from underdrive to direct drive are automatic and under load (Fig. 4-19).

Similarly, press the lower green button "-" to automatically change from overdrive to direct drive and from direct drive to underdrive under load (Fig. 4-20).

Reactions to control settings

The electronic monitoring system automatically analyzes the conditions in which the tractor is used and chooses reaction times most suitable to any condition.

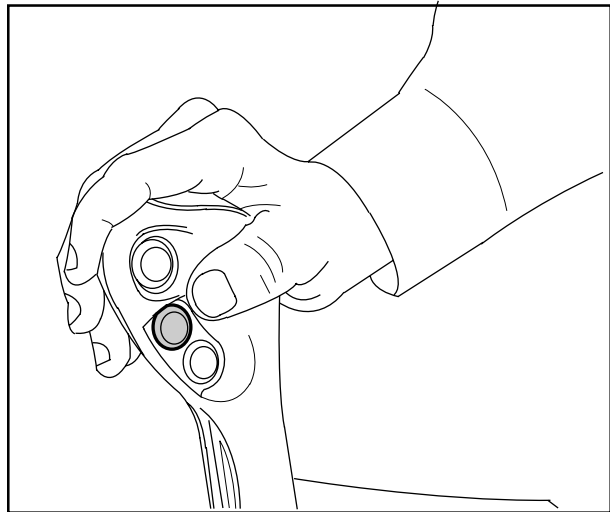


Fig. 4-19

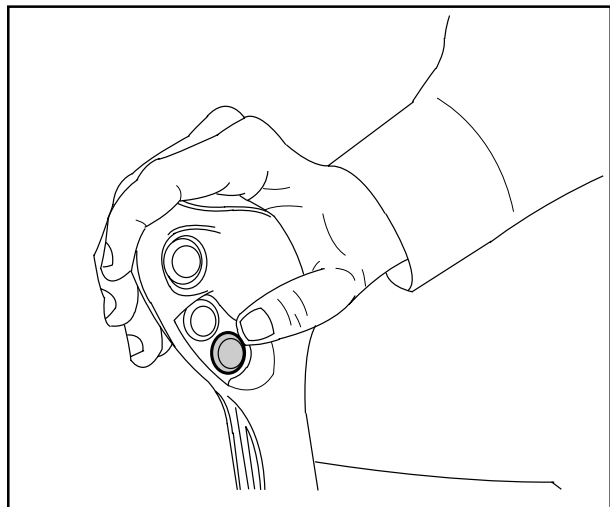


Fig. 4-20

Use of reverse shuttle under load

The tractor's driving direction is automatically reversed by pushing the orange lever (1) at the left of the steering wheel forwards or backwards (Fig. 4-21).

The reverse shuttle is automatically controlled through the following phases:

- DECELERATION
- STOP
- CHANGE OF DIRECTION
- ACCELERATION

The speed at which these phases take place by software.

CAUTION: Reversing can be obtained at any speed. However, to protect mechanical parts from damage, this operation should be made **ONLY** at speeds **UNDER 10 Kph**. A buzzer sounds to warn from reversing at speeds over 10 Kph. To correctly engage the reverse shuttle, reduce your speed to under 10 Kph.

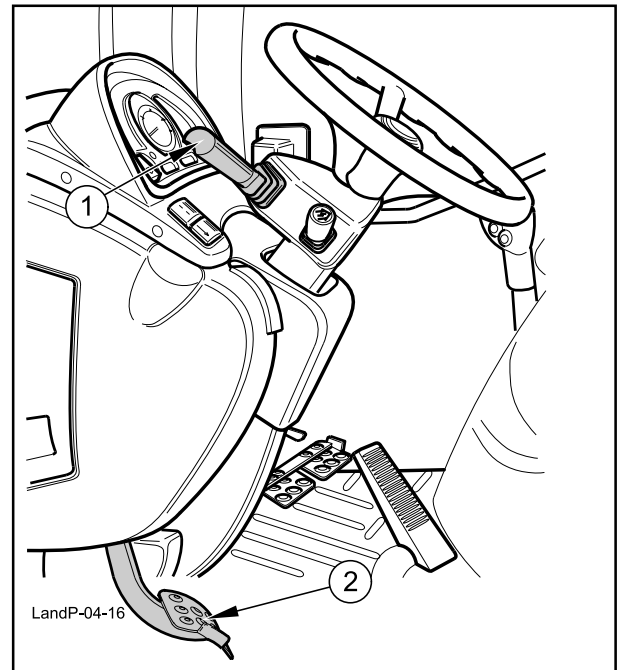


Fig. 4-21

Use of reverse shuttle with clutch pedal

The clutch pedal is used to obtain small and precise movements for certain work requirements.

- Completely depress the clutch pedal (2 - Fig. 4-21).
- Move the orange shuttle control lever (1) backward.
- Wait for the reverse indicator LED to come on.
- Use your foot on the pedal to engage the clutch gradually and let the tractor move forward or backward as required.

Operation

Stopping the tractor

Fig.4-22

Always stop the tractor safely: Engage the parking brake (1), engage the Park Lock (3), disengage the PTO, bring all the gearshift levers to neutral position, lower any implement to the ground, stop the engine and remove the ignition key BEFORE leaving the driver's seat.

Park Lock

Fig.4-22

The Top-Tronic transmission is mechanically blocked by the lever engaging the Park Lock device (3). Therefore the Park Lock should be engaged every time you want to stop the tractor with the engine stopped, particularly when the tractor is on a slope.

To shift the lever (3), pull the block (2) upward.

To engage the Park Lock (Fig.4-22)

- 1 - Engage the parking brake (1).
- 2 - Engage the Park Lock: Release the locking device (2) and pull up the engagement lever (3).

To disengage the Park Lock (Fig.4-22)

- 1 - Release the locking device (2) and lower the lever (3) to disengage the Park Lock.
- 2 - Release the parking brake (1).

The Park-Lock must be disengaged before using the reverse shuttle.

Should the reverse shuttle be engaged in forward or reverse gear with the Park-Lock still engaged, the alarm "AL" comes on the instrument panel and the buzzer sounds for 2 seconds. Disengage the Park-Lock and shift the shuttle switch to neutral.

Now the shuttle can be shifted to FWD or REV gear and the tractor started.

ATTENTION: To avoid damage to the Park-Lock system, an automatic device prevents it to be engaged if the parking brake is disengaged. Therefore, always brake first, then engage the Park-Lock. Always disengage the Park-Lock first, then the parking brake.

ATTENTION: When the Park-Lock is engaged, the engine can be started, but not so the tractor; while the buzzer sounds. The Park-Lock must be disengaged for the tractor to start.

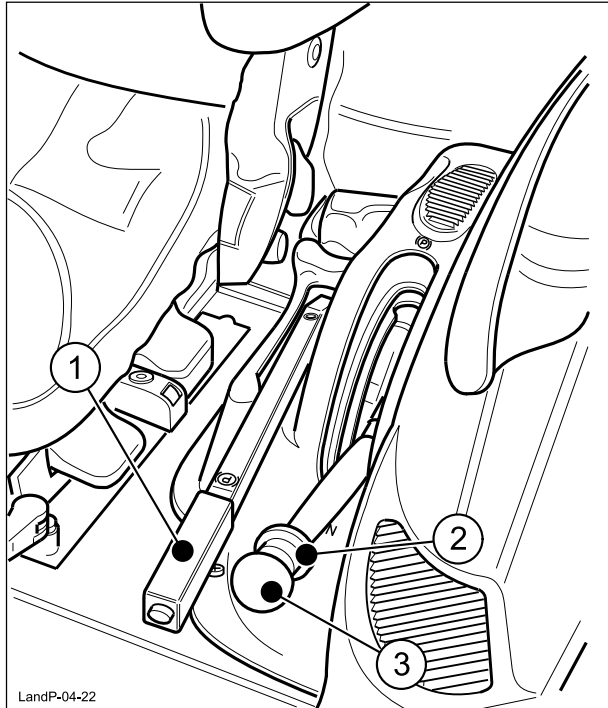


Fig.4-22

Top-Tronic maintenance

Top-Tronic transmission oil: see specifications in lubricant and fuel table.

For the maintenance operations of the Top-Tronic transmission, see the Top-Tronic maintenance chapter.

Top-Tronic troubleshooting

A buzzer operates and the flashing message "AL" followed by a number appears in the ground speed and PTO RPM digital display on the instrument panel (Fig. 4-23) if the **Top-Tronic** system becomes faulty. The number that follows the letters AL identifies the incorrect manoeuvre or the **Top-Tronic** operational fault, according to the following scale of seriousness:

AL9+number: highly serious fault.

AL8+number: fault of medium seriousness.

AL7+number: fault of minimum seriousness

AL2+number: mechanical fault

Please contact your Dealer's Service to have the problem solved.

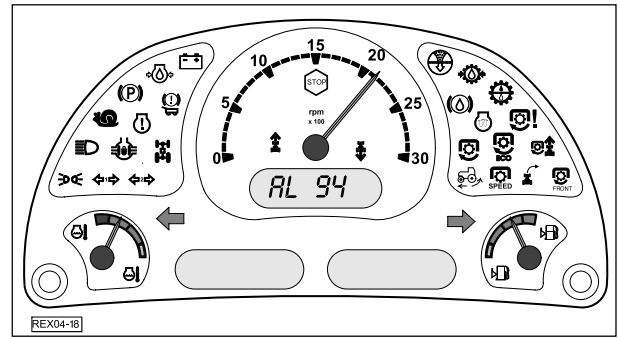


Fig. 4-23

PRIORITY 9 - Alarm code AL9.... is blinking on the digital display. Buzzer is on.

Code	Function	Problem detected	Note
AL99	Power fault (+) (-) of sensors	1.Short circuit (detected) 2.Open circuit	Machine in neutral
AL98	Faulty clutch pedal sensor	1.Short circuit (detected) 2.Open circuit	Machine in neutral.
AL97	Faulty left-hand speed sensor.	1.Short circuit (detected) 2.Open circuit	Machine remains in engaged mode. Autostart allowed. No autodeclutch.
AL96	Faulty right-hand speed sensor	1.Short circuit (detected) 2.Open circuit 3. Mechanical fault (damaged sensor)	Machine remains in engaged mode. Autostart allowed. No autodeclutch.
AL95	Faulty engine RPM sensor	1.Short circuit (detected) 2.Open circuit 3. Mechanical fault (damaged sensor)	Machine remains in engaged mode. All Automode functions are allowed.
AL94	Faulty Park-Lock switch.	1.Short circuit (detected) 2.Open circuit	Machine in normal mode.
AL93	Not used.		
AL92	Not used.		
AL91	Not used.		
AL90	Reverse shuttle lever.	1. Mechanical fault (both switches ON)	Machine in neutral. FWD/REV gears disactivated.

PRIORITY 8 - Alarm code AL8.... is blinking on the digital display. Buzzer is on.

Code	Function	Problem detected	Note
AL89	Reverse shuttle lever in forward gears	1.Short circuit (detected) 2.Open circuit	Machine in neutral if lever is on FWD gears. Otherwise, it remains operating. FWD gears are disabled.
AL88	Reverse shuttle lever in reverse gears	1.Short circuit (detected) 2.Open circuit	Machine in neutral if lever is on REV gears. Otherwise, it remains operating. REV gears are disabled.
AL87	Declutch button	1.Short circuit (detected) 2.Open circuit	Machine remains in present status, declutch disactivated. Machine in neutral if in FWD gears.
AL86	MODE clutch control solenoid valve	1.Short circuit (detected) 2.Open circuit	Further functions are active. Machine in neutral if in FWD or REV gears.
AL85	DIRECT clutch control solenoid valve	1.Short circuit (detected) 2.Open circuit.	Further functions are active.
AL84	Reverse gear control switch	1.Short circuit (detected) 2.Open circuit	If REV gears are engaged, REV is disactivated. If REV gears are engaged, REV is maintained until shuttle lever is in neutral, then REV is disactivated. Further functions are active.
AL83	Reverse gear solenoid valve	1.Short circuit (detected) 2.Open circuit	If REV gears are not engaged, REV is disactivated. If REV gears are engaged, the machine goes into neutral and REV is disactivated. Further functions are active.
AL82	Synchro PTO switch	1.Short circuit (detected) 2.Open circuit	PTO brake solenoid valve is ON. Engagement of independent PTO is allowed. Further functions are active.
AL81	PTO brake solenoid valve	1.Short circuit (detected) 2.Open circuit	Independent PTO not allowed.
AL80	PTO solenoid valve	1.Short circuit (detected) 2.Open circuit	Further functions are allowed.

Operation

PRIORITY 7 - Alarm code AL7.... is blinking on the digital display. Buzzer is off.

Code	Function	Problem detected	Note
AL79	Underdrive switch	1.Short circuit (detected) 2.Open circuit	If underdrive is not engaged, it is deactivated. If underdrive is engaged, it is maintained until the solenoid valve is activated, then underdrive is deactivated. Further functions are enabled.
AL78	Overdrive switch	1.Short circuit (detected) 2.Open circuit	If underdrive is not engaged, it is deactivated. If underdrive is engaged, it is maintained until the solenoid valve is activated, then underdrive is deactivated. Further functions are enabled.
AL77	Creeper switch	1.Short circuit (detected) 2.Open circuit	If creeper is not engaged, it is deactivated. If creeper is engaged, it is maintained until the solenoid valve is activated, then creeper is deactivated. Further functions are enabled.
AL76	Underdrive solenoid	1.Short circuit (detected) 2.Open circuit	If underdrive is not engaged, it is deactivated. If underdrive is engaged, machine goes into neutral, then underdrive is deactivated. Further functions are enabled.
AL75	Overdrive solenoid	1.Short circuit (detected) 2.Open circuit.	If overdrive is not engaged, it is deactivated. If overdrive is engaged, machine goes into neutral, then overdrive is deactivated. Further functions are enabled.
AL74	Creeper solenoid	1.Short circuit (detected) 2.Open circuit	If creeper is not engaged, it is deactivated. If creeper is engaged, machine goes into neutral, then creeper is deactivated. Further functions are enabled.
AL73	Overdrive/Underdrive switches	1.Short circuit (detected) 2.Open circuit	Overdrive/Underdrive not allowed. Further functions are enabled.
AL72	Steering angle sensor	1.Short circuit (detected) 2.Open circuit	Auto function not allowed. Further functions are enabled.
AL71	Gearbox oil thermal sensor	1.Short circuit (detected) 2.Open circuit	Uses a fixed temperature. Further functions are enabled.
AL70	Not used		

PRIORITY 2 - Alarm code AL2.... is blinking on the digital display. Buzzer is on.
Mechanical Timeout=Preset response time for engagement/disengagement

Code	Function	Problem detected	Note
AL28	Mech.timeout REV synchro OFF	REV synchro does not engage within preset time.	When REV gears are requested, the machine remains in neutral and AL28 + buzzer are activated. AL28 + buzzer stop when the shuttle lever is brought into neutral position.
AL27	Mech.timeout creeper synchro OFF	Creeper synchro does not engage within preset time.	When creeper engagement is requested, the machine remains in neutral and AL27 + buzzer are activated. Bring the shuttle lever into neutral position to reactivate the function.
AL26	Mech.timeout underdr. synchro OFF	Underdrive synchro does not engage within preset time.	When underdrive engagement is requested, the machine remains in neutral and AL26 + buzzer are activated. AL26 + buzzer stop when the shuttle lever is brought into neutral position. Further functions remain enabled.
AL25	Mech.timeout overdr. synchro OFF	Overdrive synchro does not engage within preset time.	When overdrive engagement is requested, the machine remains in neutral and AL25 + buzzer are activated. AL25 + buzzer stop when the shuttle lever is brought into neutral position. Further functions remain enabled.
AL24	Mech.timeout REV synchro ON	REV synchro does not disengage within preset time.	Reverse, overdrive and underdrive are disabled. Only direct drive is enabled. AL24 + buzzer are active until disengagement of the reverse synchro.
AL23	Mech.timeout creeper synchro ON	Creeper synchro does not disengage within preset time.	The machine goes into neutral from reverse, overdrive and underdrive. Only direct drive is enabled. AL23 + buzzer are active until disengagement of the creeper synchro.
AL22	Mech.timeout underdrive synchro ON	Underdrive synchro does not disengage within preset time.	The machine goes into neutral and AL22 + buzzer are activated. Only direct drive is enabled. Underdrive, overdrive, reverse and creeper are disabled.
AL21	Mech.timeout overdrive synchro ON	Overdrive synchro does not disengage within preset time.	The machine goes into neutral and AL21 + buzzer are activated. Only direct drive is enabled. Underdrive, overdrive, reverse and creeper are disabled.

Mechanical Power take off

Mechanical PTO controls - Fig. 4-24 and Fig.4-25

- 1 - PTO clutch engagement lever (1 - Fig.4-24).
- 2 - Independent or synchronized PTO selector lever (2 - Fig.4-25).
- 3 - 540/540ECO RPM or 540/1000 RPM PTO selector levers (3 - Fig.4-25).

Power take-off clutch engagement

Power take-off clutch control lever (1 - Fig. 4-24):

Pull the lever (1) to its coupling point to disengage the PTO clutch. To engage it, release the lever by pressing on the control (2) on the lever itself.

1 - Mechanical PTO clutch lever.

- up = PTO disengaged.
- down = PTO engaged.

2 - Coupling of PTO clutch engagement lever.

CAUTION: When working with PTO, only disengage the clutch for the time strictly required to carry out manoeuvres.

Power take off operating mode selector lever (2 - Fig. 4-25)

-  Independent PTO.
The PTO is driven straight by the engine.
-  Neutral
-  PTO proportional to ground speed.
The PTO is driven by the gearbox.
(Locked at the factory. See at page 75 for release procedure).

CAUTION: When the PTO is not used, keep the control lever (1 - Fig. 4-24) of the relative clutch in the forward position (clutch engaged) and disengage the PTO with the relative control (2 - Fig. 4-25). When working with the PTO, only disengage the relative clutch for the time strictly required to carry out the various manoeuvres.

CAUTION: When using the PTO and the tractor is stationary, always make sure that the lever of the speed range selector is in neutral and that the parking brake is engaged.

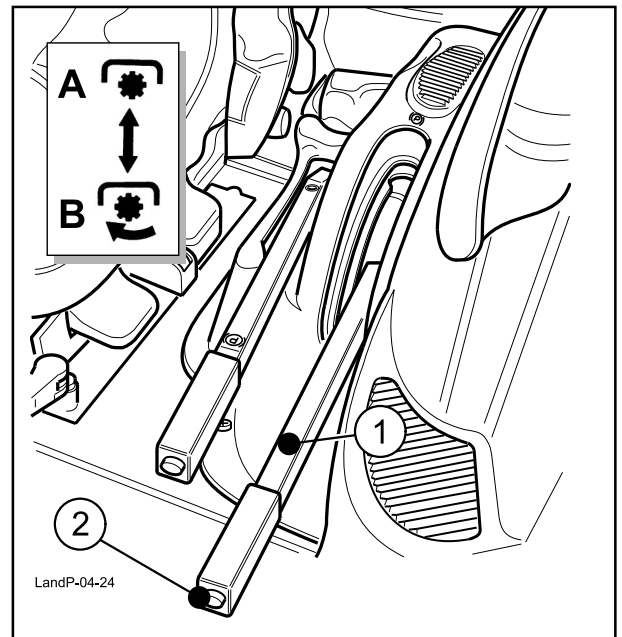


Fig. 4-24 Mechanical PTO clutch engagement lever (1).

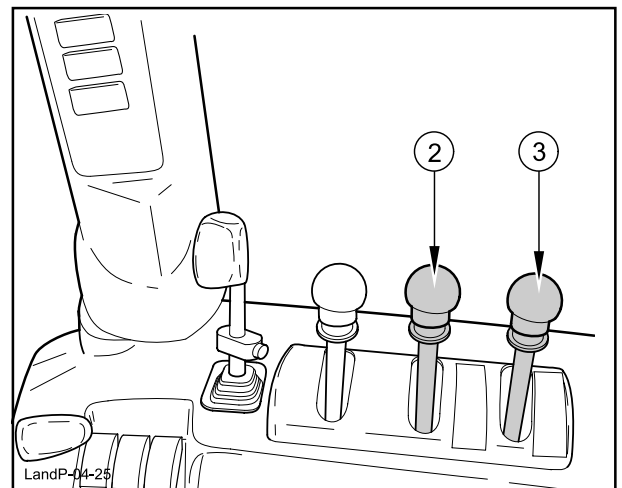


Fig. 4-25

Independent PTO

The independent PTO can operate at 540 RPM with a 1944 RPM engine rate or at 1000 RPM with a 1956 RPM engine rate (540ECO RPM with a 1322 RPM engine rate is available on request). In this operating mode, the PTO is driven straight by the engine and it operates irrespective of the tractor ground speed.



WARNING: For high-inertia implements (e.g. stone crusher, mill etc.) the universal joint for cardan shaft is to be used.



WARNING: High-inertia implements do not stop immediately after the independent PTO has been disengaged. Wait for the implement to slow down or stop completely before performing any cleaning or adjustment operations.

Operation

Mechanical PTO Speed selection

To switch from 540 RPM to 1000 RPM (or 540ECO RPM) and vice versa, use the speed selector hand lever (3 - Fig. 4-25) that can have three positions:



540 RPM PTO

N

Neutral



1000 RPM or 540ECO RPM

CAUTION: The PTO must be disengaged when changing from one speed to the other.

CAUTION: Use the PTO at 540 RPM to operate implements designed for this speed or at 1000 RPM (or 540ECO RPM) for implements designed to operate at 1000 RPM (or 540ECO RPM).

Economy power take-off

A PTO speed of 540 RPM can be obtained (for implements that do not require maximum power, such as fertilizer spreaders, sprayers, etc.) by using the PTO at 540ECO RPM and decelerating to 1322 RPM. The PTO economy mode has a number of advantages, including a reduction in fuel consumption, noise and vibrations.

CAUTION: Economy PTO 540 ECO runs at 1322 RPM. Never exceed 1817 RPM engine rate (corresponding to 630 RPM of the PTO driveline) to avoid damages to the driveline itself and the connected implement.

Operation in paddy fields

CAUTION: When using the tractor in paddy fields or marshy ground, where the water level could rise above the height of the PTO, ask your dealer for instructions on all necessary waterproofing and sealing measures. If such measures are not taken, the guarantee could be rendered invalid.

Mechanical power take-off speed indicator

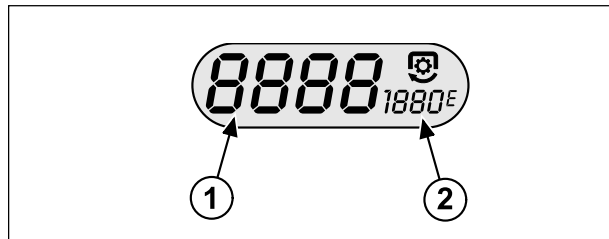


Fig. 4-26

The indicator (1) displays the operating rate of the PTO with great accuracy. The operating rate of implements for which the rotation speed must be precisely selected can therefore be kept under constant control. Speed indicator of the PTO engaged (2): 540RPM; 540ECO RPM; 1000RPM.

PTO overspeed (NAO markets only)

The indicator light (1 - Fig.4-27) on the dashboard comes on if the max. allowed rated PTO speed is exceeded. Reduce the engine rated speed to reduce the PTO speed.

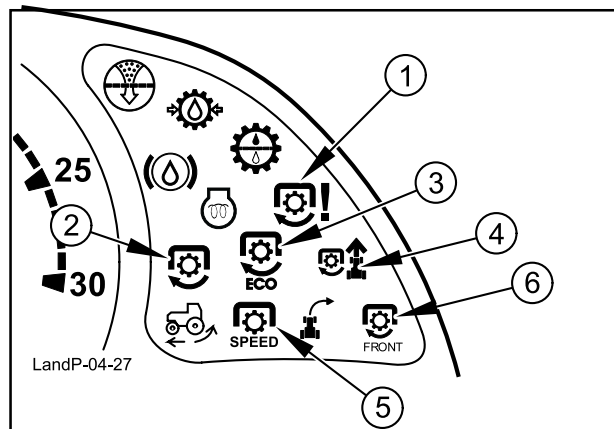


Fig. 4-27

- 1- Overspeed power take-off (only NAO markets).
- 2 - Rear independent PTO engaged indicator – orange.
- 3 -Indicator of 540ECO RPM PTO engaged – orange.
- 4 -Synchronized PTO engaged indicator – orange.
- 5 - PTO speed selector lever engaged indicator - orange.
- 6 - Front PTO engaged indicator (if mounted) - orange.

Synchronized ground drive PTO mode

On request

Synchronized use of the rear power take-off (lever 2 - Fig. 4-25) with the gearbox is solely designed for towing self-driven trailers and, more generally, for all those farming implements which have to operate in synchronism with tractor movement and which do not require more than 40 - 45% of rated engine power. Engage the synchronized PTO with the tractor at a standstill; disengage the gearshift clutch by depressing the clutch pedal.

WARNING: When using the synchronized PTO and if you are forced to reverse once or several times, remember that the driveline inverts its spinning direction. Thus, with certain implements, it is advisable to disengage the PTO when reversing in order to avoid serious damage.

Synchronized PTO revolutions

Whichever forward gear is engaged, the splined shaft of the PTO accomplishes, for each turn of the rear wheels:

PTO type	PTO driveline revolutions	
540	11.26	12.126
540ECO	16.54	17.818
1000	20.627	22.312

How to use the synchronized PTO Techno

Fig.4-27b

To avoid an accidental engagement of the synchronized PTO, which would cause early wear of the hydraulic PTO brake, the synchronized PTO is provided at the factory with a locking device.

To use the synchronized PTO, remove the lock screw (3) preventing the lever engagement (4).

1. The lock screw (3) is on the engagement cable of the synchronized PTO on the left-hand side of the tractor.
2. Shift the selector lever (2 - Fig.4-25) in neutral or in independent PTO position.
3. Remove the check nut (1).
4. Loosen the screw (3) and remove it together with the nut (2).

CAUTION: After using the synchronized PTO, fit the lock screw again to prevent accidental engagement of the PTO.

1. Shift into the independent PTO position (2, Fig.4-25) the synchronized PTO engagement lever.
2. Fit the lock screw again (3) with the nut (2). Tighten the screw.
3. Shift the synchronized PTO engagement lever into the central neutral position (2, Fig.4-25) .
4. Loosen the screw (3) until it touches the engagement lever (4) in neutral position as shown by figure 4-27b.
5. Lock the screw with the nut (2) and check nut (1).

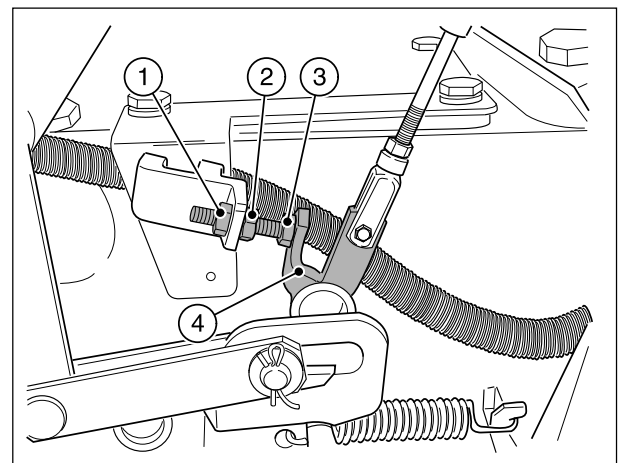


Fig.4-27b

Operation

Electro-hydraulic PTO

The rear power take-off is fully independent from the transmission. It is engaged by means of a multi-disc oil-cooled hydraulic clutch.

The PTO is engaged by means of the switch (1- Fig.4-29).

An indicator light on the instrument panel comes on when the PTO is engaged (2 - Fig.4-32).

Use: engagement/disengagement

Engage/disengage the front PTO (1 - Fig.4-28 and Fig.4-29) by the ON/OFF button switch with engine at idling speed.

Depressed button switch: disengaged PTO

Released button switch: engaged PTO

To engage the PTO, release the switch (1) by pulling up the locking collar (2) (Fig.4-29).

Always shift the switch in the OFF disengaged position (Fig.4-28) after using the PTO or before starting the engine.

NOTE: The engine can be started only if the PTO engagement switch is in the OFF position and the PTO engagement lever (3 - Fig.4-30) is in the neutral position.

Engage the PTO at a low RPM speed to protect the clutch and driveline.

Select the operating mode and the required speed before engaging the PTO.

IMPORTANT: For high-inertia implements (e.g. stone crusher, mill etc.) the universal joint for cardan shaft is to be used.



WARNING: When using the PTO with the tractor at a standstill, always make sure that the creeper lever of the gearbox is in neutral position and that the parking brake is engaged.



WARNING: High-inertia implements do not stop immediately after the independent PTO has been disengaged. Wait for the implement to slow down or stop completely before performing any cleaning or adjustment operations.

IMPORTANT: When using implements that cause shock loads, always use a safety coupler between the implement and the PTO drive shaft. Before using the implement, check the correct operation both of the safety coupler and of the implement.

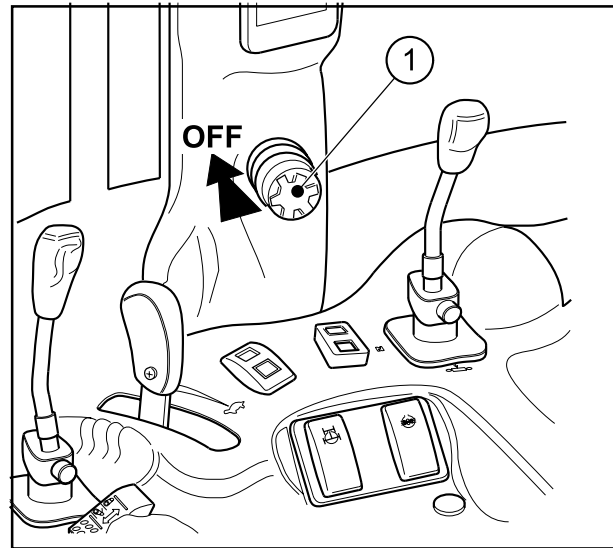


Fig. 4-28 - Disengagement

Fully depress the ON/OFF switch (1). The PTO indicator light on the instrument panel (2 - Fig.4-32) goes off.

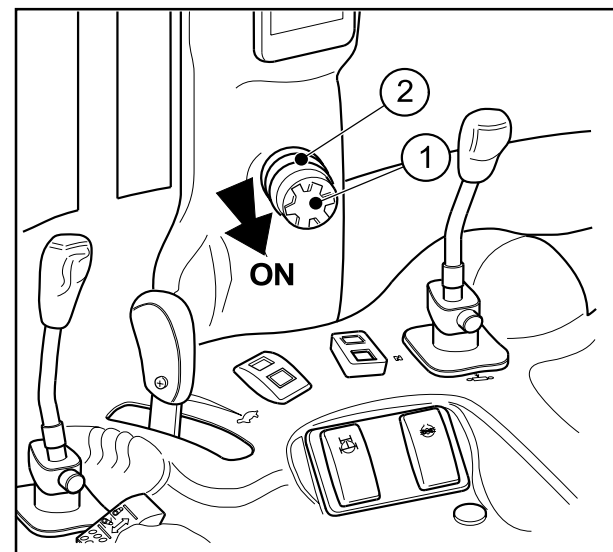


Fig. 4-29 - Engagement

Pull up the locking collar (2) of the ON/OFF button, then pull the button (1) to the ON position. Now the button will remain on the ON position, while the PTO indicator light on the instrument panel (2 - Fig.4-32) lights up.

IMPORTANT: When using implements with quickly moving parts (such as mowers, reapers, snowplows) ALWAYS fit an overrun device on the implement drive shaft, as a protection against possible PTO faults.

Electro-hydraulic Power take off

Electro-hydraulic PTO controls - Fig. 4-30

- 1 - PTO clutch engagement switch.
- 2 - Independent or synchronized PTO selector lever.
- 3 - 540/540ECO RPM or 540/1000 RPM PTO selector levers.

PTO operation

Power take off operating mode selector lever (2 - Fig. 4-30).



Independent PTO.
The PTO is driven straight by the engine.



Neutral



PTO proportional to ground speed.
The PTO is driven by the gearbox.
(Locked at the factory. See at page 75 for release procedure).

Independent PTO

The independent PTO can operate at 540 RPM with a 1944 RPM engine rate or at 1000 RPM with a 1956 RPM engine rate (540ECO RPM with a 1322 RPM engine rate is available on request). In this operating mode, the PTO is driven straight by the engine and it operates irrespective of the tractor ground speed.



WARNING: For high-inertia implements (e.g. stone crusher, mill etc.) the universal joint for cardan shaft is to be used.



WARNING: High-inertia implements do not stop immediately after the independent PTO has been disengaged. Wait for the implement to slow down or stop completely before performing any cleaning or adjustment operations.

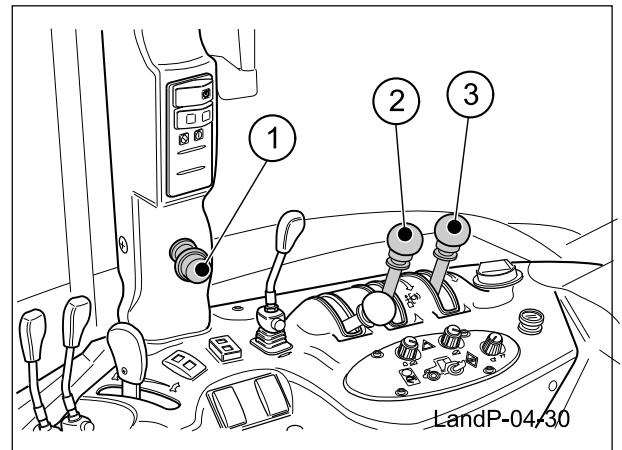


Fig. 4-30

Power take-off engagement

Fig. 4-30

- Select the required speed 540/540ECO/1000 RPM with the selector lever (3).
- Engage the PTO mode selector lever (2).
- Engage the power take-off (1).
- During the work, the PTO can be engaged/disengaged by means of the relative control lever (1).

Electro-hydraulic PTO speed indicator

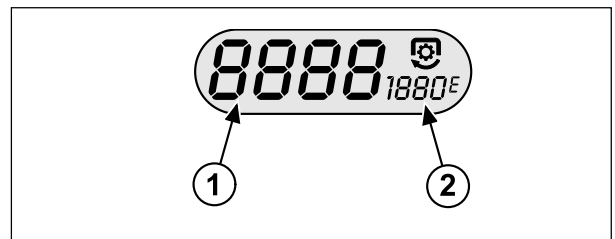


Fig. 4-31

The indicator (1) displays the operating rate of the PTO with great accuracy. The operating rate of implements for which the rotation speed must be precisely control can therefore be kept under constant control. Speed indicator of the PTO engaged (2): 540RPM; 540ECO RPM; 1000RPM.

Operation

Speed selection

To switch from 540 RPM to 1000 RPM (or 540ECO RPM) and vice versa, use the speed selector hand lever (3 - Fig. 4-30) that can have three positions:



540 RPM

N

Neutral



1000 RPM or 540ECO RPM

CAUTION: When the PTO is not used, the speed range selector lever should always be in neutral position (lever 3, position N, Fig. 4-30).

CAUTION: Disengage the PTO clutch (switch 1, Fig. 4-28) before switching between two speed ranges.

WARNING: Only use PTO at 540 RPM (or 540ECO) or at 1000 RPM to drive implements designed for such respective rotation speeds. Never allow the PTO shaft to rotate at more than 630 RPM with implements designed for 540 RPM.

Economy power take-off

A PTO speed of 540 RPM can be obtained (for implements that do not require maximum power, such as fertilizer spreaders, sprayers, etc.) by using the PTO at 540ECO RPM and decelerating to 1322 RPM. The PTO economy mode has a number of advantages, including a reduction in fuel consumption, noise and vibrations.

CAUTION: Economy PTO 540 ECO runs at 1322 RPM. Never exceed 1817 RPM engine rate (corresponding to 630 RPM of the PTO driveline) to avoid damages to the driveline itself and the connected implement.

PTO overspeed (NAO markets only)

The indicator light (1 - Fig. 4-32) on the dashboard comes on if the max. allowed rated PTO speed is exceeded.

Reduce the engine rated speed to reduce the PTO speed.

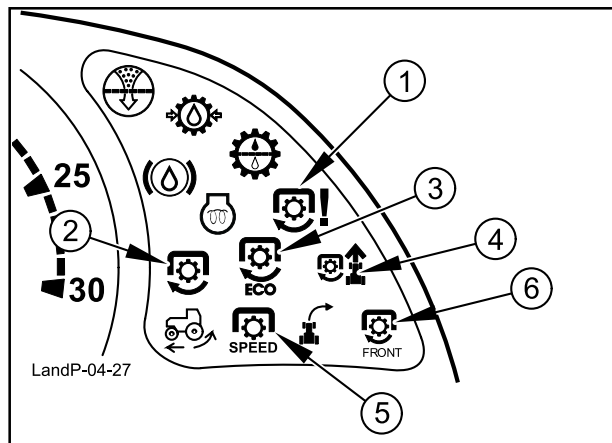


Fig. 4-32

- 1- Overspeed power take-off (only NAO markets).
- 2 - Rear independent PTO engaged indicator – orange.
- 3 - Indicator of 540ECO RPM PTO engaged – orange.
- 4 - Synchronized PTO engaged indicator – orange.
- 5 - PTO speed selector lever engaged indicator - orange.
- 6 - Front PTO engaged indicator (if mounted) - orange.

Synchronized ground drive PTO mode

On request

Synchronized use of the rear power take-off (lever 2 - Fig.4-30) with the gearbox is solely designed for towing self-driven trailers and, more generally, for all those farming implements which have to operate in synchronism with tractor movement and which do not require more than 40 - 45% of rated engine power. Engage the synchronized PTO with the tractor at a standstill; disengage the gearshift clutch by depressing the clutch pedal.

WARNING: *When using the synchronized PTO and if you are forced to reverse once or several times, remember that the driveline inverts its spinning direction. Thus, with certain implements, it is advisable to disengage the PTO when reversing in order to avoid serious damage.*

Synchronized PTO revolutions

Whichever forward gear is engaged, the splined shaft of the PTO accomplishes, for each turn of the rear wheels:

PTO type	PTO driveline revolutions	
540	11.26	12.126
540ECO	16.54	17.818
1000	20.627	22.312

PTO external engaging button

To make connection easier, use the buttons (1 - Fig. 4-33) on the rear fenders.

To operate the buttons, engage the PTO by means of the switch (1 - Fig. 4-29) and select the required speed with the PTO selector levers (2-3 - Fig. 4-30).



WARNING: *Risk of entanglement. Keep clear of rotating shafts. Be careful NOT to get caught up by the cardan shaft of the PTO drive-line. Keep all guards in place on the transmission shafts on the tractor and implements.*

Press the external button (1 - Fig. 4-33) to stop the PTO shaft rotation.



WARNING: *High-inertia implements do not stop immediately after the independent PTO has been disengaged. Wait for the implement to slow down or stop completely before performing any cleaning or adjustment operations.*

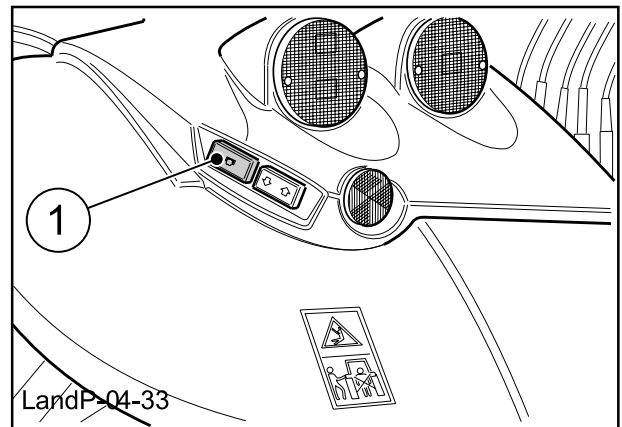


Fig. 4-33

Operation

How to change PTO drivelines

Various types of PTO driveline are available:

- 13/8" (34.9 mm) diameter driveline with 21 splines, for 1000 RPM PTO, standard assembly.
- 13/8" (34.9 mm) diameter driveline with 6 splines, for 540 RPM PTO, mounted on request.
- 13/4" (44.45 mm) diameter driveline with 6 splines, mounted on request.
- 13/4" (44.45 mm) diameter driveline with 20 splines, mounted on request.

To change the output shaft, first remove the spring ring (2 - Fig. 4-34) using special nippers (3).

Take out the shaft (1). Thoroughly grease the new shaft and fit it in place, making sure that it is fully inserted in its housing.

Fit the spring ring correctly back in place: replace it if it is damaged or deformed.

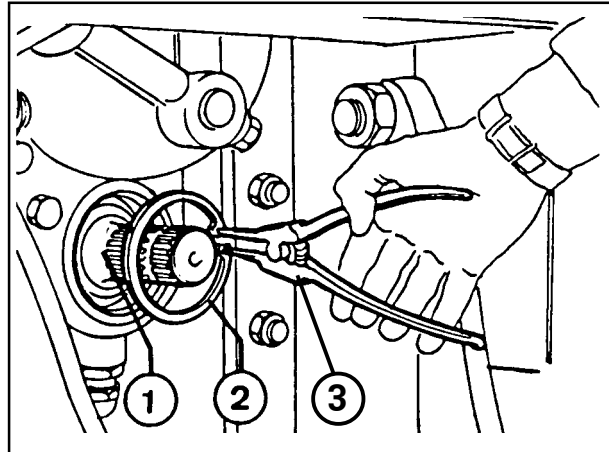


Fig.4-34

PTO driveline connections

The 1000 RPM driveline has 21 splines and is standard assembly. The 540 RPM driveline has 6 splines and is supplied with the tractor. Both drivelines are 35 mm in diameter and have a round groove so that the implement can be correctly coupled. A removable cap protects the grooving and the operator when the PTO is not used.

1. Unscrew and remove the cap that protects the PTO and keep it safe in the tool box so that it can be fitted back when required (Fig. 4-35).
2. Connect the PTO driveline to the tractor's splined shaft. Make sure that the locking device fixes the shaft firmly in place.
3. Make sure that all protections are mounted (1-2 Fig. 4-35).

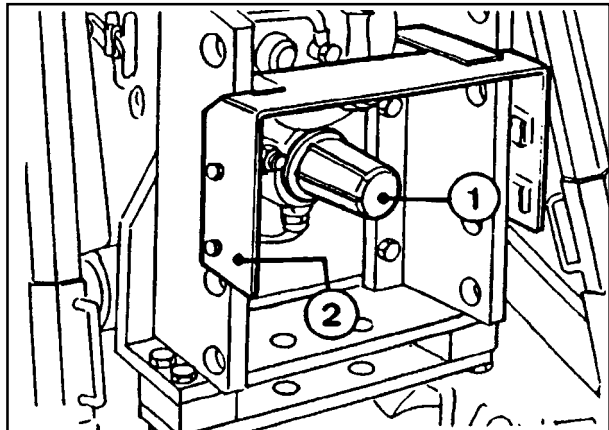


Fig.4-35

CAUTION: Never use the PTO driveline for 540 RPM if the implement used requires a power greater than 56 kW (75 HP) since damages to the driveline itself and to the connected implements could injure bystanders. Implements requiring 56 kW (75 HP) may be used only with PTO drivelines at 1000 RPM.

Precautions when using the PTO



WARNING: PTO shafts and implements operated by means of the PTO can be extremely dangerous. It is therefore advisable to comply with the following important instructions:



PTO SHAFT GUARDS: NEVER operate without the PTO cap (1, Fig. 4-36) or shield (2, Fig. 4-36) mounted. These parts protect persons from injuries and the shaft splines from damage.



WARNING: Before connecting, adjusting or working on implements operated by the PTO, disengage the PTO, stop the engine, remove the key from the dashboard and engage the parking brake. Do not work under raised implements.



WARNING: Check to make sure that all implements operated by the PTO are fitted with the correct protections, are in a good condition and comply with the provisions established by law.



WARNING: Before driving an implement through the PTO, ALWAYS make sure that all bystanders are well away from the tractor.



WARNING: Fix the drawbar in the central position when using implements that are driven by the PTO of the tractor.



WARNING: When using the PTO drive with a stationary tractor, ALWAYS make sure that the gears are in neutral and that the parking brake is applied.



WARNING: Before starting up any PTO-driven implement hitched to the three-point linkage, lift the implement to its full height using position control and check that at least 1/4 of the total length of the telescopic section of the drive shaft is engaged.



WARNING: High-inertia implements do not stop immediately after the independent PTO has been disengaged. Wait for the implement to slow down or stop completely before performing any cleaning or adjustment operations.

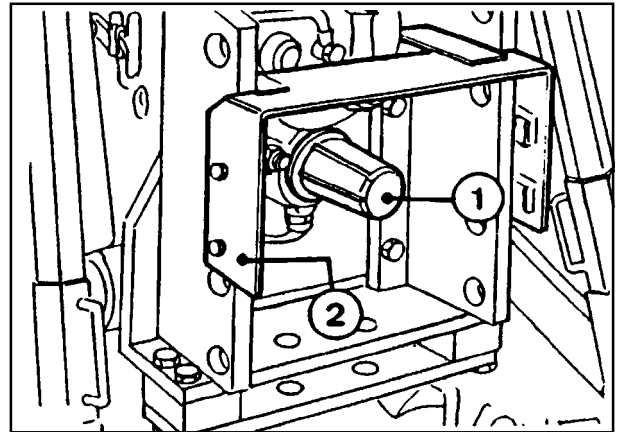


Fig. 4-36

Paddy fields warning

CAUTION: When using the tractor in paddy fields or marshy ground, where the water level could rise above the height of the PTO, ask your dealer for instructions on all necessary waterproofing and sealing measures. If such measures are not taken, the guarantee could be rendered invalid.

Operation

Brakes

The rear brakes are multi-disc oil-cooled units. Brake action is hydraulic, controlled by pumps operated by the pedals (1 - Fig. 4-37). The brake fluid reservoir (1 - Fig. 5-25) keeps the brake circuit supplied with fluid.



WARNING: When changing or topping up the brake fluid in the reservoir, be absolutely sure to use the correct type of fluid as different varieties have totally different properties. These machines use an LHM mineral-based fluid. Never mix or exchange brake fluids. See the Lubricant and Fuel Chart.

Main brakes

The main brakes are operated by means of two pedals (1 - Fig. 4-37), one for each rear wheel. Braking on one side assists steering in tight manoeuvres. By locking the rear wheel on the inside of a curve, you can virtually turn the tractor around on its own axis. For simultaneous braking during normal use and for on-road use, simply lock the two pedals together with the special brake coupling lock (2 - Fig. 4-37). It becomes even more important to do this if the tractor is also equipped with front brakes since a device installed in the hydraulic control circuit only allows the front brakes to be used if the two pedals are operated at the same time.



WARNING: Always keep the brake pedals coupled for on-road driving to ensure simultaneous braking on all four wheels. Never use the brakes independently when driving on public roads.



WARNING: If you ever notice the brakes becoming less effective, identify the cause immediately and repair. When working on slopes, avoid using the brakes as much as possible and select a lower gear in order to use engine braking.

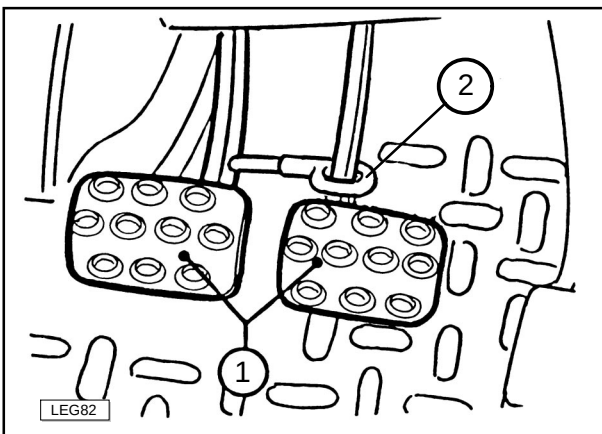


Fig.4-37

Parking brake

A hand lever (1 - Fig. 4-38) controls the parking brake. This acts, via a series of linkages, directly on the brake discs and is fully independent of the foot brakes. The parking brake can therefore also be used as an emergency brake.

The parking brake lever is held in place by a ratchet mechanism.

To release the lever, simply press the button at the end of the lever.

A red warning light on the instrument panel comes on to show that the parking brake is engaged.

NOTE: For Top-Tronic see the description (page 78) "Stopping the Top-Tronic tractor" by means of the Park-Lock control lever (3 - Fig. 4-38).

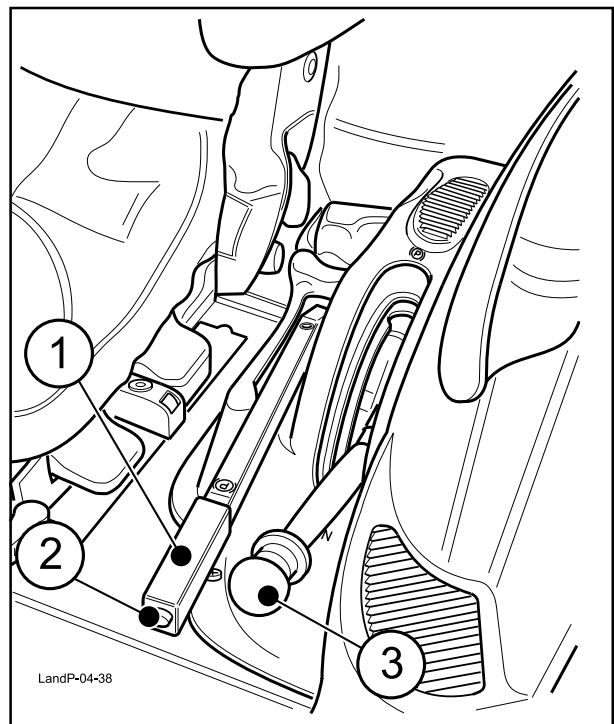


Fig.4-38

Hydraulic trailer brake (Approved for ITALY)

The tractor braking system can be equipped with a hydraulic valve (1 - Fig. 4-39) which, if connected to the hydraulic circuit of the trailer brakes, allows the trailer itself to be braked along with the tractor.

Comply with the following instructions to correctly connect and disconnect the flexible trailer brake tube to and from the union (2 - Fig. 4-39) at the rear of the tractor and to always operate in conditions of the utmost safety.

The trailer-tractor connecting tube can be connected and disconnected with the engine either running or at a standstill:

- With the engine at a standstill: there are no difficulties when either connecting or disconnecting as there is no oil pressure in the brake circuit.
- With the engine running: it is essential to engage the hand brake since this ensures that no pressure remains in the brake circuit.

CAUTION: *It is extremely important to always carry out this operation before detaching the trailer from the tractor since it ensures the immediate action of the automatic safety braking system with which this trailer braking system is obligatorily equipped.*

There is a specific indicator light (3 - Fig. 4-39) on the control panel of the tractor which keeps the operator constantly informed about the operating conditions of the trailer brake oil tap.

Indicator light off:

- When the oil tap is not connected to the trailer.
- When the pressure of the oil in the circuit is regular with the trailer connected.

Indicator light on:

- When the engine is at a standstill and the ignition key is turned to first position.
- When the hand brake is engaged with the engine running.



WARNING: *If the indicator light should come on in conditions differing from those mentioned above, this means that there is a fault in the braking system and that use of it must immediately stop for safety reasons.*

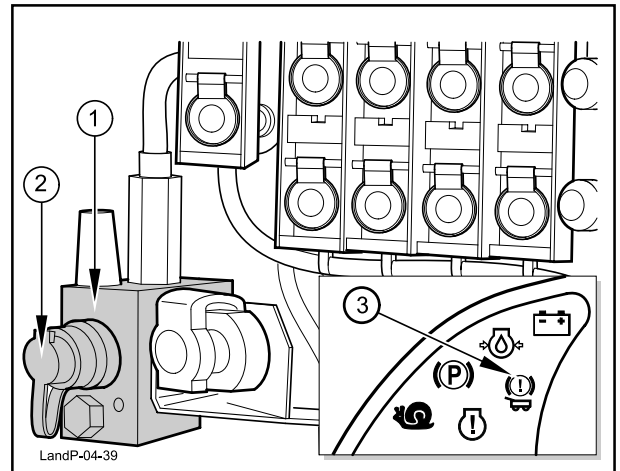


Fig.4-39

Hydraulic trailer brake (Approved for FRANCE and EXPORT market)

The tractor braking system can be equipped with a dedicated hydraulic valve (1 - Fig. 4-40) that, if connected to the hydraulic circuit of the trailer brakes, allows the trailer to be braked along with the tractor. The flexible tube of the trailer brakes should be connected to the union (2 - Fig. 4-40) installed at the rear of the tractor.

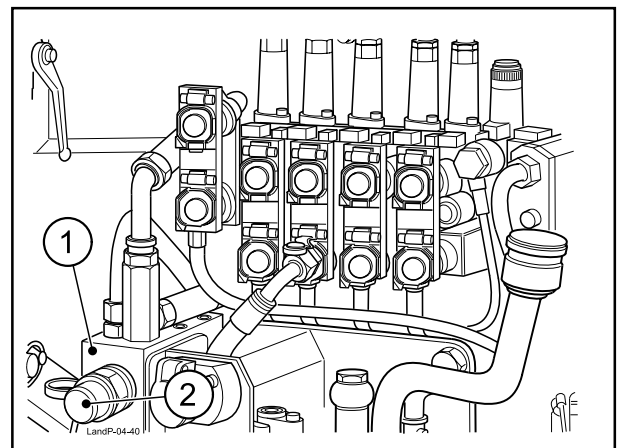


Fig.4-40

Operation

Locking the differential

The tractors are fitted with a system for locking the differential on the rear and front axles on 4WD models. They are used when a wheel slips because of lack of grip. To lock the differentials, just press the button (2 - Fig. 4-41) under the control panel of the electronic power lift for a second.

A yellow function indicator on the instrument panel lights up to indicate that the diff lock is engaged.

NOTE: *For the best results, engage the diff lock before the wheels are likely to slip. Do not engage the lock while one of the wheels is actually slipping.*

Depress one or both of the brake pedals to disengage the diff lock.



WARNING: *Disengage the diff lock when driving on roads or when you need to turn the tractor.*

Four-wheel drive

4WD increases traction on broken ground, mud and slippery surfaces, etc.

Press the button (1 - Fig. 4-41) to engage 4WD. When 4WD is engaged, an indicator light on the instrument panel comes on. When it is disengaged, the light remains off.

NOTE: *Only use four-wheel drive when strictly necessary. Avoid use of 4WD when maximum traction is not required, e.g. on hard ground, roads, etc., since this would only increase tyre wear unnecessarily.*

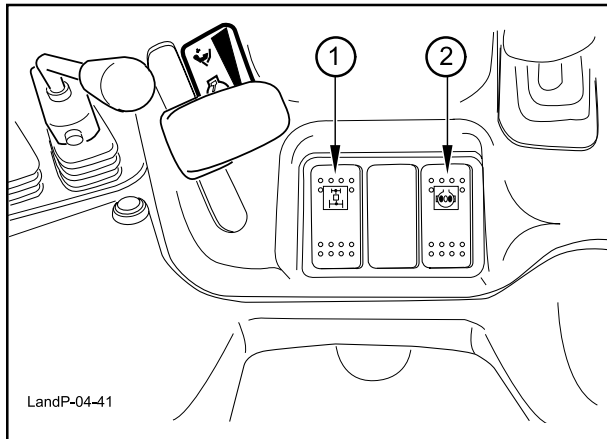


Fig. 4-41

Adjusting the max. steering angle

The maximum steering angle of the 4WD front axle can be varied depending on the type of tyre mounted and the way the tractor is used. The angle is changed by loosening the nut (2) and adjusting the stop screw (1 - Fig. 4-42) on the final drive of the axle. Then tighten the nut (2) again.

This adjustment is very useful when adopting minimum track since it prevents the wheels from clashing with the bonnet.

The maximum steering angle is 55°.

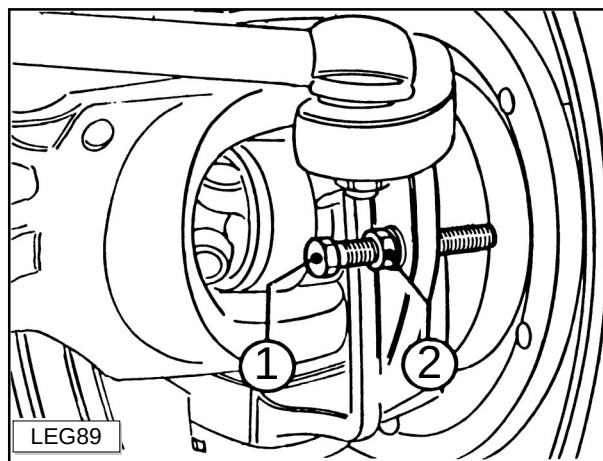


Fig. 4-42

Steering limit on front fender

To avoid the front fender clashing with the engine at the max. steering angle, the hub cap rotation can be stopped while leaving the kingpin free to reach the max. steering angle (Fig. 4-43).

Loosen the nut (2) and adjust the screw (3) so that it hits the bolt (1) before the hub cap clashes with the engine. Then tighten the nut (2).

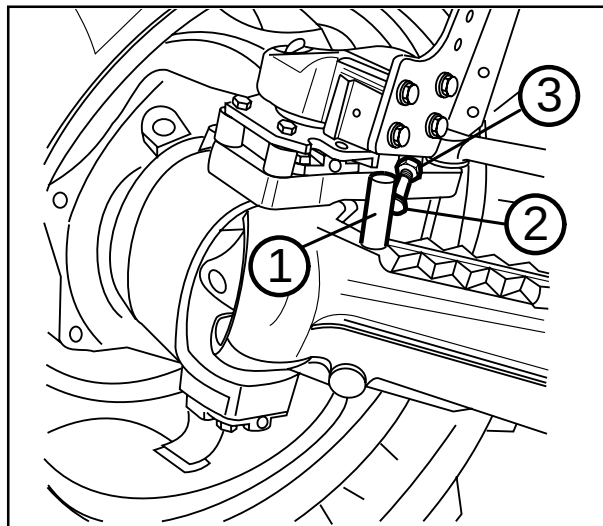


Fig. 4-43

Operation

Adjusting front-wheel track

4WD axle - Adjusting front-wheel track

The front track on 4WD tractors can be adjusted by changing the position of the hubs and central wheel discs as shown in the table below (Fig. 4-45).

Make sure that the wheel nuts are correctly tightened to the prescribed torque wrench setting (Fig. 4-44):

1 - Disk to hub: 270 Nm

2 - Rim to disk: 210 Nm

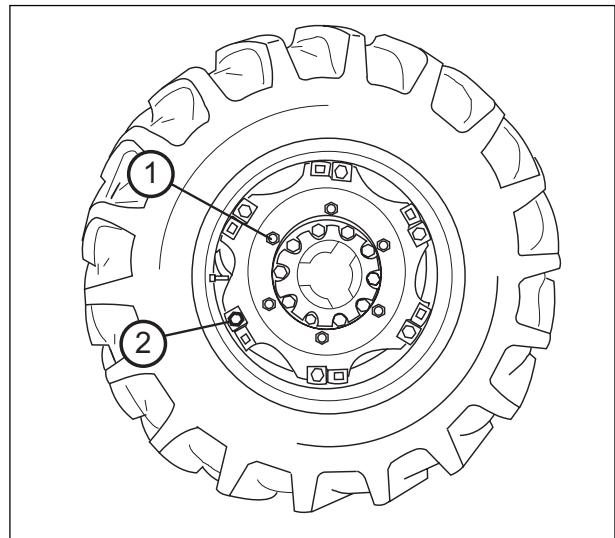


Fig. 4-44

Adjusting front-wheel track for 4WD axle			
Wheel disc pointing inwards		Wheel disc pointing outwards	
A		E	
B		F	
C		G	
D		H	

Fig. 4-45

Adjusting front-wheel tracks - Table Fig. 4-45

Type of front tyre	Radius index mm	Rims	Front-wheel tracks - mm							
			Landpower 125 - 135 Axle with central brakes - Interflange 1897							
			A	B	C	D	E	F	G	H
420/70 R24*	590	W13-24	1666	1779	1867	1947	1947	1980	2035	2148
480/65 R24*	590	W13-24	1666	1779	1867	1947	1947	1980	2035	2148
380/70 R28	610	W12-28	1597	1709	1803	1879	1897	2009	2103	2215
14.9 R28	640	W12-28	1597	1709	1803	1879	1897	2009	2103	2215
420/70 R28	640	W14L-28	1597	1709	1803	1879	1897	2009	2103	2215
480/65 R28	640	W14L-28	1597	1709	1803	1879	1897	2009	2103	2215

* The wheels marked by an asterisk (420/70 R24 and 480/65 R24) are not mounted on Landpower 135.

Type of front tyre	Radius index mm	Rims	Front-wheel tracks - mm							
			Landpower 145 Axle with central brakes - Interflange 1920							
			A	B	C	D	E	F	G	H
14.9 R28	640	W12-28	1620	1732	1826	1902	1920	2032	2126	2238
420/70 R28	640	W14L-28	1620	1732	1826	1902	1920	2032	2126	2238
480/65 R28	640	W14L-28	1620	1732	1826	1902	1920	2032	2126	2238
16.9 R28	670	W14L-28	1620	1732	1826	1902	1920	2032	2126	2238
480/70 R28	670	W14L-28	1620	1732	1826	1902	1920	2032	2126	2238
540/65 R28	670	W14L-28	1620	1732	1826	1902	1920	2032	2126	2238
480/65 R28*	670	W14L-28	-	-	-	1900	1960	-	-	-
540/65 R28*	670	W14L-28	-	-	-	1900	1960	-	-	-
480/70 R28*	670	W14L-28	-	-	-	1900	1960	-	-	-

* The wheels marked by an asterisk are approved for 50 Kph for suspended axle only.

Operation

Adjusting front-wheel tracks - Table Fig. 4-45

Type of front tyre	Radius index mm	Rims	Front-wheel tracks - mm Landpower 165 Axle with central brakes - Interflange 1920							
			A	B	C	D	E	F	G	H
16.90 R28	670	W14L-28	1590	1702	1796	1875	1890	2002	2096	2208
480/70 R28	670	W14L-28	-	-	-	-	-	-	-	-
540/65 R28	670	W14L-28	1590	1702	1796	1875	1890	2002	2096	2208
540/65 R28*	670	W14L-28	-	-	-	1900	1960	-	-	-
480/70 R28*	670	W14L-28	-	-	-	1900	1960	-	-	-

* The wheels marked by an asterisk are approved for 50 Kph (if permitted).

Type of front tyre	Radius index mm	Rims	Front-wheel tracks - mm Landpower 185 Axle with central brakes - Interflange 1816							
			A	B	C	D	E	F	G	H
16.90 R28	670	W14L-28	1516	1628	1722	1798	1816	1928	2022	2138
480/70 R28*	670	W14L-28	1516	1628	1722	1798	1816	1928	2022	2138
540/65 R28*	670	W14L-28	1516	1628	1722	1798	1816	1928	2022	2138

* The wheels marked by an asterisk are approved for 50 Kph (if permitted).

Adjusting rear-wheel tracks Landpower 125 - 135

The rear-wheel track can be adjusted by changing the position at which the rear wheels are fixed to the wheel hubs or by inverting the position of the wheel discs (Fig. 4-47)

The torque wrench setting of the fastening nuts and bolts (Fig. 4-46) of the rim to the disk (1) is 240 Nm, and of the disk (2) to the wheel hub is 320 Nm. It is extremely important to check that the tyres are inflated to the prescribed pressure.

Some tracks are not obtainable with certain types of tyres (see table).



WARNING: When jacking up the tractor, make sure that the weight is correctly distributed and that the wheels are well beld on the ground. Tighten all the nuts and bolts to the correct torque wrench setting.

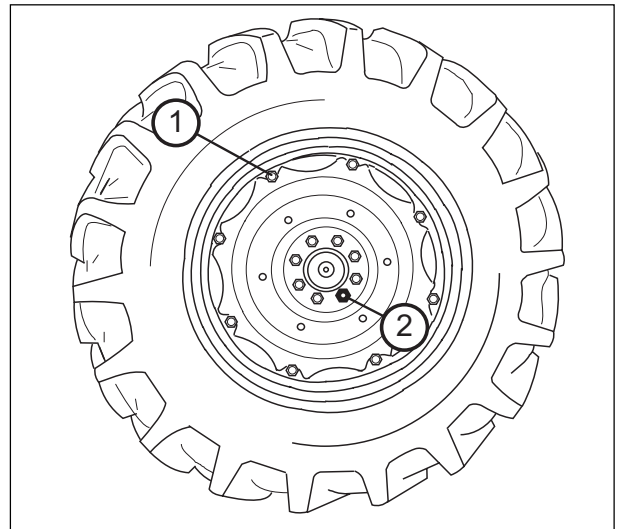
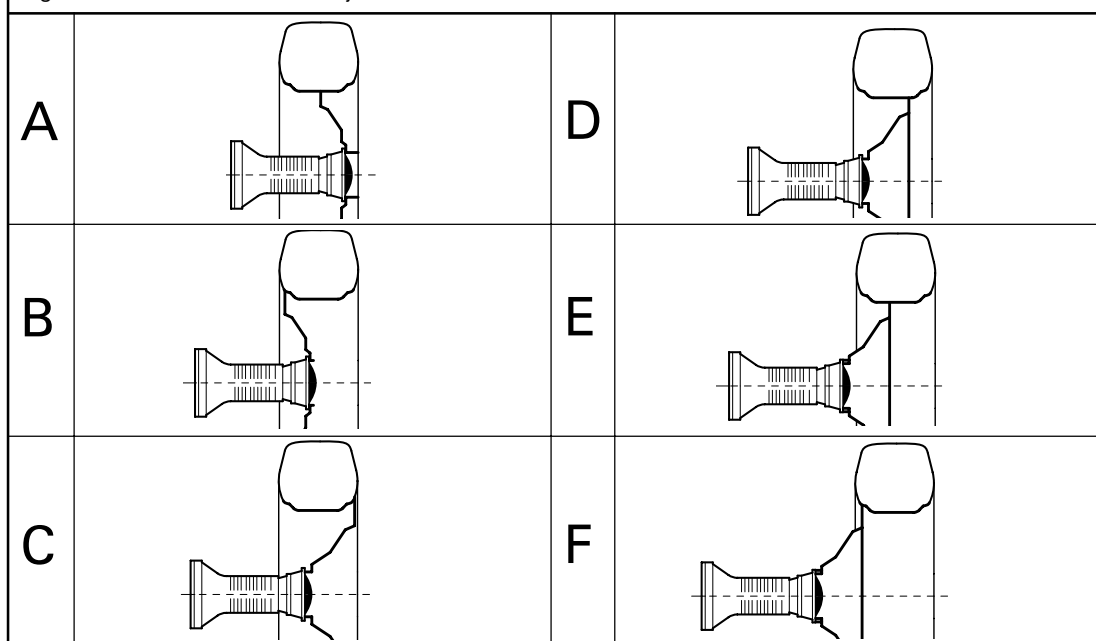


Fig. 4-46 - Landpower 125-135

Fig. 4-47 - Rear-wheel track adjustment - Positions of rim and disk



Type of front tyre	Radius index mm	Rims	Front-wheel tracks - mm Landpower 125						Front-wheel tracks - mm Landpower 135					
			A	B	C	D	E	F	A	B	C	D	E	F
520/70 R34	770	DWW16-34	-	1699	1781	1898	1982	2103	-	-	-	-	-	-
600/65 R34	770	DWW16-34	-	-	1781	1898	1982	2103	-	-	-	-	-	-
480/70 R38	795	DWW15-38	1592	1692	1788	1888	1982	2092	1592	1692	1788	1888	1992	2092
520/70 R38	820	DW18L-38	-	1692	1788	1888	1982	2092	-	1692	1788	1888	1992	2092
600/65 R38	820	DW18L-38	-	-	1788	1888	1982	2092	-	-	1788	1888	1992	2092
18.4 R38	820	DWW15-38	1592	1692	1788	1888	1982	2092	1592	1692	1788	1888	1992	2092

Operation

Mod. 145 -165 - 185 Rear wheel tracks

These models have a splined axle shaft where the hub slides. This allows the interflange (1 - Fig. 4-50) to be adjusted from 1896 mm to 2358 mm for Landpower 145 and from 1926 to 2358 mm for Landpower 165 - 185. This allows different track widths to be obtained by moving the wheel on the axle shaft, by changing the rim fixing points or by changing the positions of the sheet metal wheel discs.

The torque wrench setting for the nuts and bolts that fix the rim to the disc (2 - Fig. 4-48) is 280 Nm and 320 Nm to fix the disc to the wheel hub (1 - Fig. 4-48).



WARNING: *Never use the tractor if the hub and rim bolts are slack. The bolts that fix the disc to the rim must be gradually torqued in at least three stages and in a crosswise fashion until all have been locked to the appropriate torque setting.*

NOTE: *Landpower 185 is provided only with discs welded to the rims.*

Mod. 145 -165 - 185 - Flange adjustment on the axle shafts

See Fig. 4-48 and 4-49:

- Jack up the tractor to take the weight off the wheels. Slacken off two hub bolts (1) by about five turns. Remove the two remaining bolts and screw them into the puller holes (2).
- Tighten these latter until they touch the flange. Continue to screw them in alternately until the flange has been released. The hub will now be free to slide on the axle shaft.

NOTE: *If the hub remains locked on the axle shaft, insert a wedge shaped tool into the slit in the hub in order to enlarge it slightly.*

- Set the hub in the desired point and remove the two bolts (2). Tighten the fixing bolts to a 15-18 Kgm (108-130 ft.lbs) torque setting.
- Proceed in the same way for the other wheel.



WARNING: *There is a right-hand hub and a left-hand one. They cannot be interchanged with each other.*

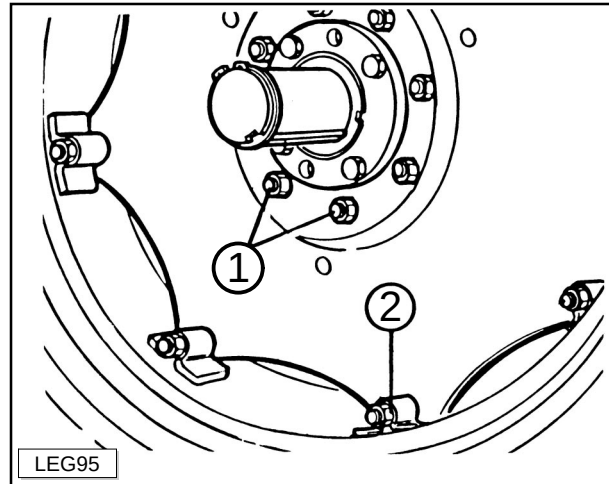


Fig. 4-48 - Landpower 145 - 165 - 185

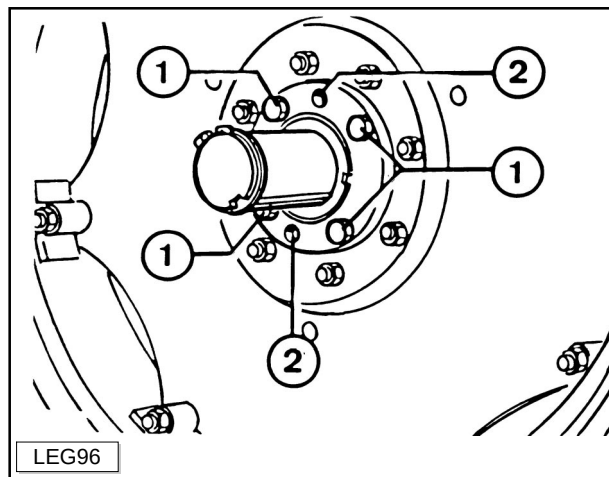


Fig. 4-49- Landpower 145 - 165 - 185

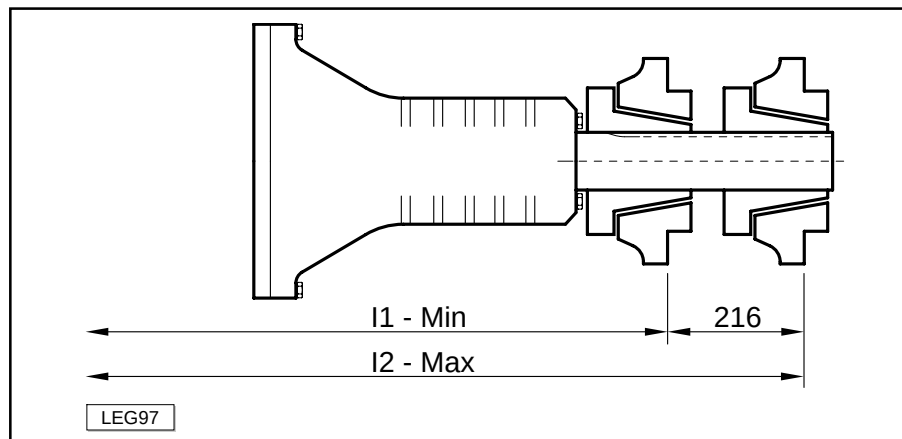


Fig. 4-50

Interflange *	Mod. 145 mm	Mod. 165 - 185 mm
I1 Minimum	1896	1926
I2 Maximum	2328	2358

* The interflange (I) between the external flange that fixes the wheels on to the two adjustable hubs varies from a minimum 1896 mm to a maximum 2328 mm for Landpower 145 and from 1926 mm to 2358 mm for Landpower 165 and 185.

Lots of intermediate positions can therefore be obtained. The available track widths are doubled by setting the wheel disc inwards or outwards.

The following tables only show minimum tracks with hubs in the tightest position and maximum tracks with hubs in the widest position.

Type of front tyre	Radius index mm	Rims	Mod. 145 Rear-wheel tracks - mm			
			Minimum		Maximum	
520/70 R38	820	DW18L-38	1660		2814	
600/65 R38	820	DW18L-38	1764		2814	
18.4 R38	820	DWW15-38	1660		2814	
20.8 R38	855	DW18L-38	1660		2814	
580/70 R38*	855	DWW18L-38	1864*		2510*	
650/65 R38*	855	DW18L-38	1864*		2510*	
Type of front tyre	Radius index mm	Rims	Rear-wheel tracks - mm			
			Mod. 165		Mod. 185*	
			Minimum	Maximum	Minimum	Maximum
20.8 R38	855	DWW18L-38	1690	2844	-	-
20.8 R38*	855	DWW18L-38	-	-	1894*	2544*
580/70 R38*	855	DWW18L-38	1894*	2544*	1894*	2544*
650/65 R38*	855	DWW18L-38	1894*	2544*	1894*	2544*
600/65 R42*	870	DWW18L-42	1894*	2544*	1894*	2544*

* Wheels with disc welded to the rim.

Operation

Wheels and tyres

Regularly check that the front and rear wheel nuts are fully tightened.

Tyre pressure must be checked and adjusted before using the tractor. Make further checks at regular intervals.

NOTE: *Tractors are supplied by the manufacturer with tyres inflated at higher pressures than recommended. The pressure should be adjusted afterwards by the user according to values given in the tables of tyre manufacturers and to the use anticipated for the tractor*

If these simple rules are carefully followed, they will ensure maximum working life for your tyres.

If you notice any cuts in the tread or side walls, have them vulcanized immediately to avoid further damage to the tyre.

Drive slowly on roads if the pressure in the tyres has been reduced for use on soft earth.

To obtain maximum efficiency, do not use tyres with more than 30-50% wear.

NOTE: *If the tractor is not going to be used for a long period of time, support it on raised blocks to remove the load from the tyres.*

NOTE: *Avoid parking the tractor on floors which are covered with oil or diesel fuel. Also avoid parking the tractor where the tyres are permanently exposed to direct sunlight, especially if the tractor is not going to be used for some time.*

Ballast

When the tyre is not sufficiently loaded in relation to the traction the tractor must produce during work, it may easily slip, causing loss of speed and wear on the tread plus reduced efficiency on the job. To get the most out of tractor power, it is therefore advisable to ballast the tractor by applying cast iron rings to the driving wheels or by filling the tyres with water.

Ballasting the front axle

If heavy implements that might destabilize the tractor are hitched to the lift, cast iron plates can be added to the front end to counterbalance their weight.

The plates have handles so that they can be mounted and demounted more easily. They should be applied to the radiator core support and fixed with the relative rods.

Mod. 125 - 135 - Fig. 4-51

Middle pack $8 \times 42 \text{ Kg} = 336 \text{ Kg}$
plus two side packs $10 \times 42 \text{ Kg} = 420 \text{ Kg}$

Mod. 145 - 165 - 185 - Fig. 4-51

Middle pack $11 \times 42 \text{ Kg} = 462 \text{ Kg}$
plus two side packs $13 \times 42 \text{ Kg} = 546 \text{ Kg}$

Mod. 185 Extra ballast holder - Fig. 4-52

Pack $19 \times 42 \text{ Kg} = 798 \text{ Kg}$
Ballast holder adding 125 Kg
Total weight 923 Kg

IMPORTANT:

- Do not ballast the tractor over its rated carrying weight.
- When using the tractor for light work, transport and on-road towing, remove the ballast to avoid unnecessary strain on the mechanical components.
- With semi-mounted and fully mounted implements (which inevitably increase the load on the rear axle of the tractor), ballast must only be used when strictly necessary. There is no point in increasing grip beyond the level necessary for efficient work as this will reduce tyre life.
- Carefully check the tyre inflation pressure since this will make the tyre last longer and ensure a more regular use.
- The softer the soil, the lower tyre inflation must be while the tyre should be inflated to a greater extent as the soil becomes more compact.

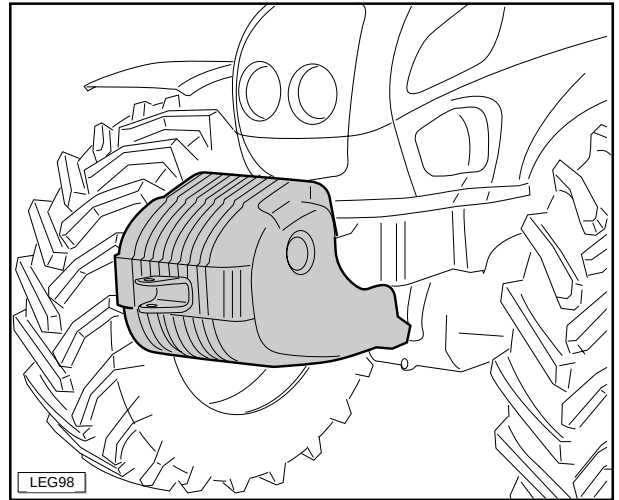


Fig. 4-51

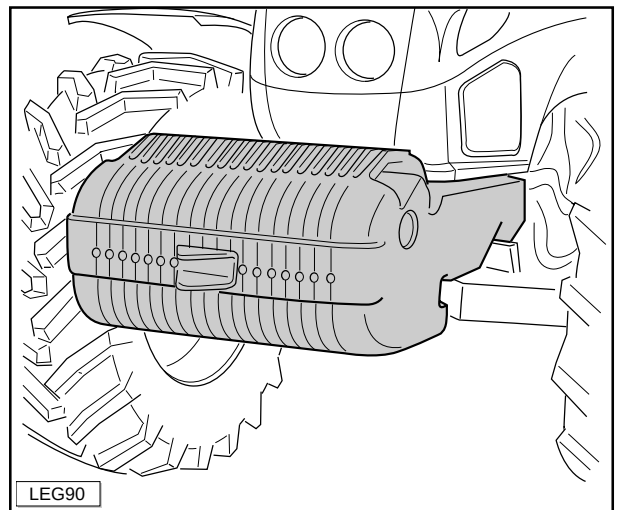


Fig. 4-52

Operation

Ballasting the rear wheels

One, two or three 85 Kg cast iron rings can be applied to each wheel (Fig. 4-53). The first is fixed straight on to the wheel while the second is fixed to the first ring and the third to the second.

The total weight that can be applied is therefore:

- Two rings: 170 Kg
- Four rings: 340 Kg
- Six rings: 510 Kg

Ballasting with water

The tractor can also be ballasted by filling the tyres with water.

To lower the freezing point a few degrees in winter, add calcium chloride to the water in compliance with the proportions given in the following table. The ballast should evidently be removed when the job does not require excessive draft, otherwise the soil could become excessively compressed.

The following table gives approximate values for the liters of water and kilos of calcium chloride required to prepare the antifreeze solution used to three-quarters (75%) fill each tyre.

In relation to ballasting with cast iron rings on the driving wheels, this type of weighting offers the following advantages:

- Low cost.
- Easy preparation.
- Improved steering.
- The weight of the driving wheels can be regulated according to the real requirements.

How to fill the tyres with water



WARNING: *when you prepare a solution of calcium chloride to ballast the tyres, NEVER EVER pour the water on to the calcium chloride since this could lead to a violent reaction. This danger can be avoided by adding the calcium chloride very slowly to the water and stirring until it has completely dissolved.*

Jack up the wheel and position it with the valve right at the top (Fig. 4-54).

Unscrew the movable union of the valve and wait until the tyre deflates.

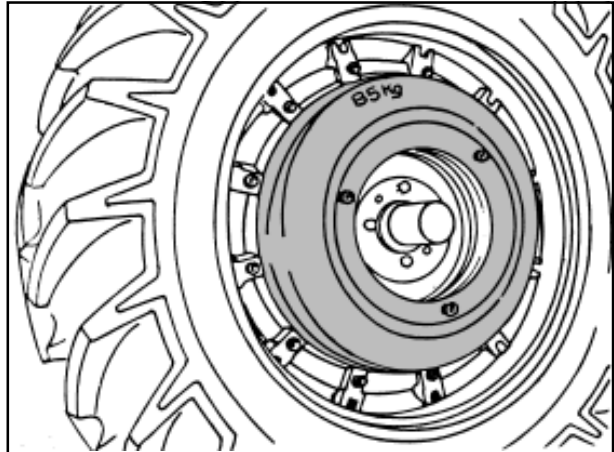


Fig. 4-53

Tighten the relative fitting (2 - Fig. 54) into the valve housing (1) and apply the tube (3). Air will escape from the little tube (4) as the tyre is filled with water.

The tyres are filled to the three-quarter mark when water escapes from the small tube (4) if this is positioned completely downwards. To add less water, i.e. obtain a lower weight, turn the wheel so that the valve is in a more downward position.

Tighten the union on the valve casing again and inflate the tyre with air until obtaining the prescribed pressure.

Take the following precautions when preparing the water-calcium chloride mixture (antifreeze solution for the cold season):

- Pour the necessary amount of water in a vessel and then pour in calcium chloride until the established quantity has been reached. Never pour water on to the calcium chloride as this would cause a violent reaction.
- Only use the solution after it has completely cooled. To limit the acidity, add 1% of sodium carbonate in proportion to the calcium chloride used.
- After inflating the tyre, thoroughly rinse any metal parts that may have been wetted with this corrosive solution, with water.

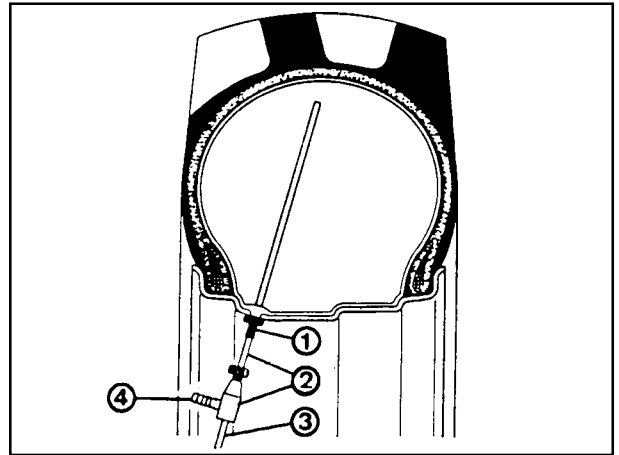


Fig. 4-54

How to deflate the tyres

Fig. 4-54

- Jack up the tyre to be deflated and set it with its valve pointing downwards.
- Unscrew the mobile union of the valve and allow the water to drain from the tyre.
- Tighten the relative union into the valve housing and place the tube (4) in contact with the tyre.
- Blow in pressurized air through the union (2): the

remaining water will drain through the tube (4).

- Remove the union (3), replace it with the valve retainer and then inflate the tyre.

NOTE - Never use ballasting systems differing from the ones indicated above.

Caution: Ballasting with water and anti-freeze solution containing calcium chloride might cause corrosion of the parts in contact with the solution.

TYRE CAPACITIES FOR BALLASTING WITH WATER				
Tyre size	Capacity to valve level (75%) litres/Kg	Ballasting with antifreeze solution		
		Commercial calcium chloride 70-72% Kg	Water litres	Total weight of solution Kg
380/70-28	156	56	132	188
420/70-24	176	64	151	215
14.9-28	180	49	160	209
16.9-28	210	57	187	244
480/70-28	268	97	231	328
18.4-38	370	100	329	429
20.8-38	480	130	427	557
480/70-38	310	84	276	360
520/70-38	380	103	338	441

NOTE: This table contains only indicative data. The operator should ballast wheels with water on the base of the tables issued by the tyre manufacturer and according to the use anticipated for the tractor.

Operation

Towing attachments

Front pull hook

The tractor may be equipped with a front pull hook (Fig. 4-55) for emergency pulling operations from the front and for towing the tractor.

Class "C" tow hook

A Class "C" tow hook "C" (Fig. 4-56) may be fitted for towing single or twin axle agricultural implements and trailers.

To make hitching the implement easier, this device can be adjusted in height; it can also be moved both above and below the PTO driveline in a total of 4 positions. See Fig. 4-57 for the available fixing heights.

To adjust the tow hook, pull out the securing pins (1 - Fig. 4-56) and the bolts (2) to free the hook and move it to the desired height.

Tow hook positioning is extremely important. Manoeuvrability and stability when driving depend on implements and trailers being hitched at the correct height.

In the higher positions, the tow hook has a greater towing capacity but the risk of lifting the tractor's front wheels is also greater.

When using four wheel drive, keep the tow hook in the lower positions so that the drawbar remains as horizontal as possible. This keeps the weight over the front axle and improves tractive force.

Distance from rear axle: 880 mm
Max. vertical load: 1500 Kg
Max. horizontal load: 6000 Kg

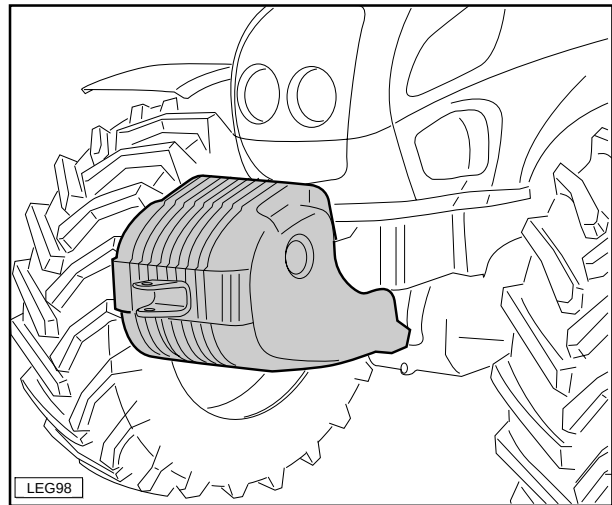


Fig. 4-55

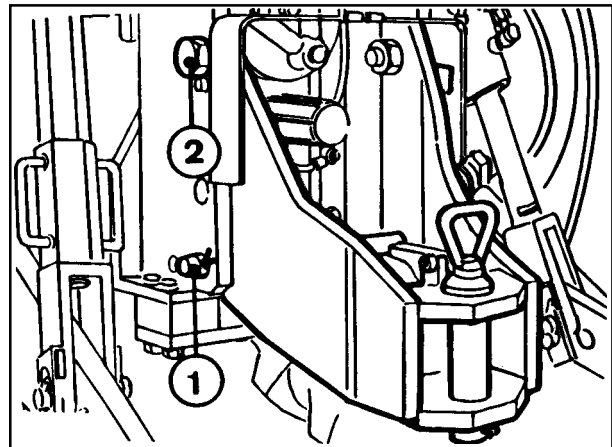


Fig. 4-56 - Class "C" tow hook

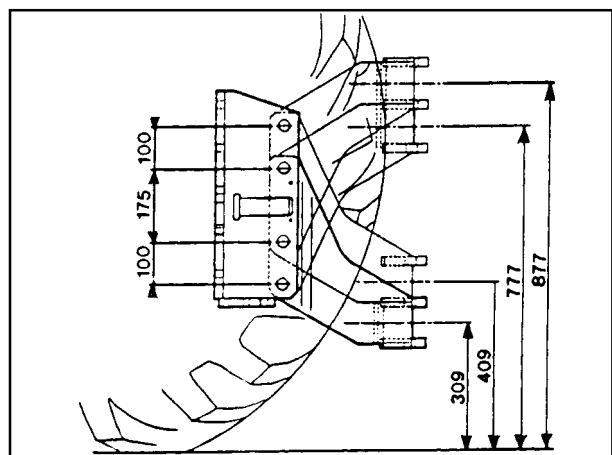


Fig. 4-57 - Class "C" tow hook (18.4 R34)

Class "D3" rear tow hook

A Class "D3" tow hook can be supplied on request for 1600 Kg trailers (Fig. 4-58).

The height from ground level can be adjusted in four positions (Fig. 4-58).

Distance from the rear axle: 880 mm

Max. vertical load: 2500 Kg

Max. horizontal load: 20000 Kg

Class "C" and "D3" tow hook with quick height adjustment

On request, the tractor can be supplied with a Class "C" (Fig. 4-59) or "D3" tow hook (Fig. 4-60) with quick height adjustment. Six heights from ground level can be obtained. A lever (A) releases the tow hook which can then slide upwards or downwards as needed.

Refer to the following table for the various height values.

Quick adjusting hooks	Type C	Type D3
Max. vertical load Kg	1500	2500
Max. horizontal load Kg	6000	20000

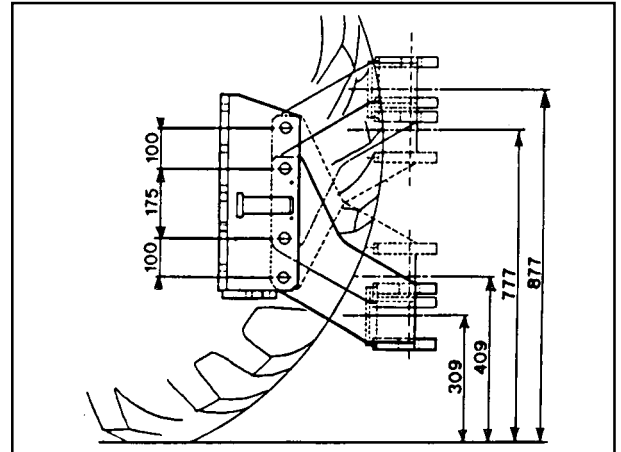


Fig. 4-58 - Class "D3" rear tow hook (18.4 R34)

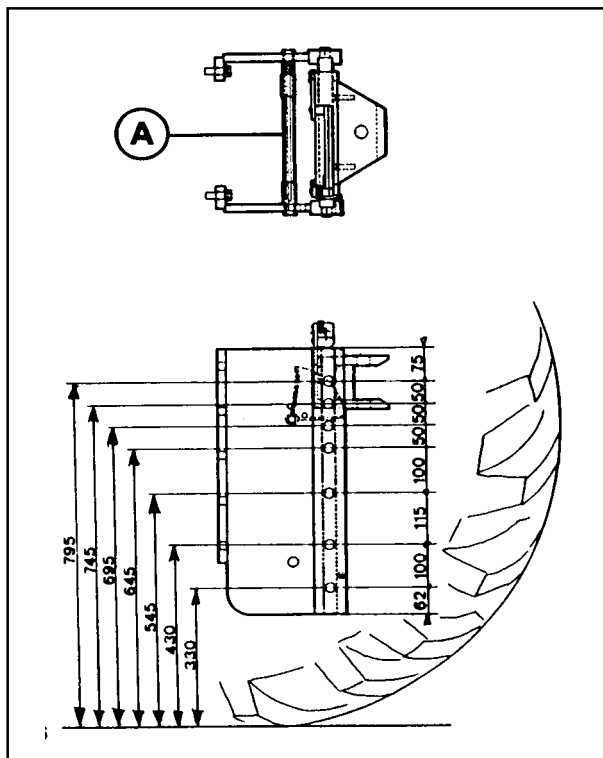


Fig. 4-59 - Class "C" rear tow hook (18.4 R34)

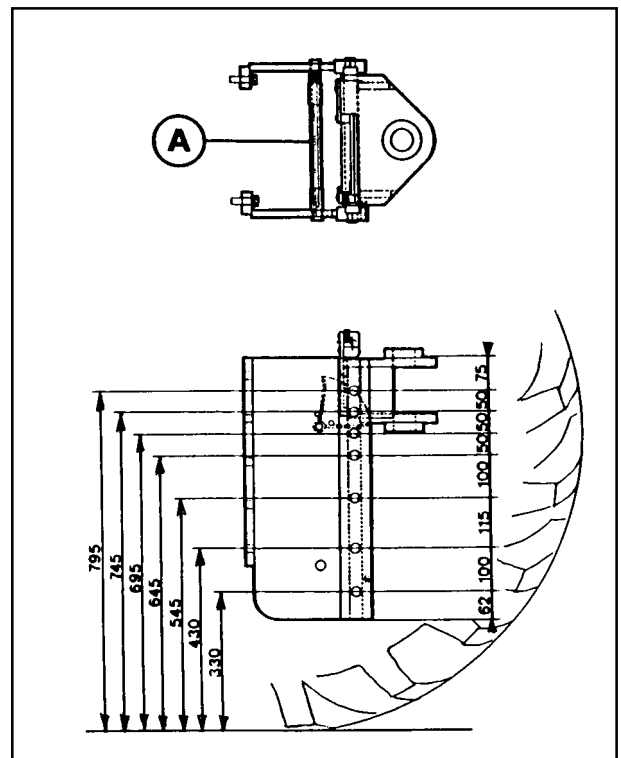


Fig. 4-60 - Class "D3" rear tow hook, adjustable in height (18.4 R-34)

Operation

Class "A" swinging drawbar

The tractor may be equipped with a Class "A" swinging drawbar (Fig. 4-61) consisting of a drawbar (2) and a cross-member. It is designed only for agricultural implements with two or more axles.

Never use this type of attachment to tow single axle implements and trailers because they can apply enough weight to the drawbar to pitch the tractor up at the front.

The drawing (Fig. 4-62) shows the various distances that can be obtained between the PTO shaft and the hitch on the drawbar. There are two possible adjustments:

- Turn the drawbar upside down so that the hitch lies over or under the bar.
- Vary the point where the cross-member is hinged on to the tractor support.

For those implements that need it, the cross member can also be used to provide considerable side swing in either direction.

The locking pins (1) can also be used to limit drawbar swing in either direction.



WARNING: When towing implements driven by the PTO, adjust the height of the drawbar so that it lies between 150 (5.9") and 300 (11.8") below the height of the PTO shaft.

Automatic tow hook

Available on request in some markets - Fig. 4-63.

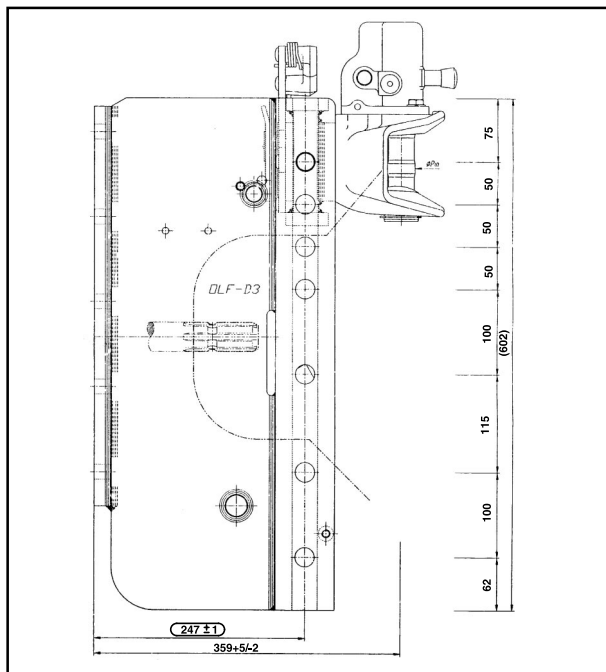


Fig. 4-63

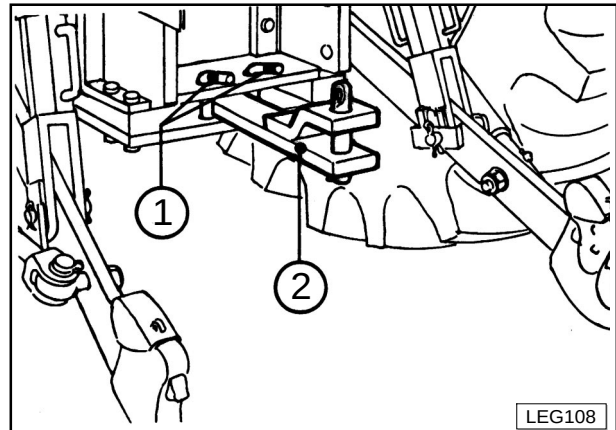


Fig. 4-61- Class "A" swinging rear drawbar.

- 1 - Drawbar.
- 2 - Fixing pins to limit swing.

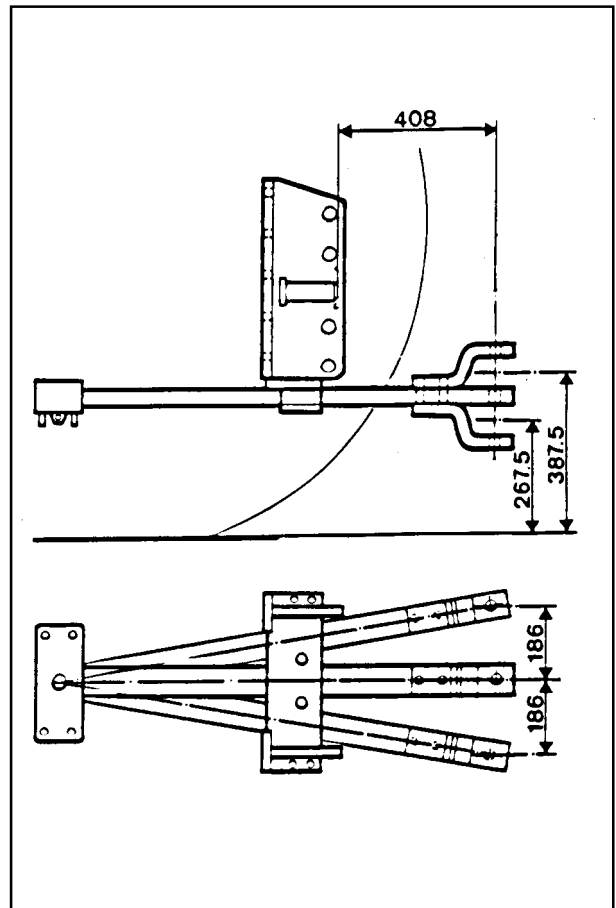


Fig. 4-62 - Class "C" tow hook (18.4/R-34)

NOTE: The Class "A" drawbar can be mounted along with the Class "C" or "D3" tow hook but only when these latter are mounted pointing upwards.

Implement hitch

The three point linkage is used to connect the tractor to implements controlled by the hydraulic lift.

The three-point linkage is suitable for connection to implements of various classes as shown by the diagram and data given in Fig. 4-64.

A Cat. II three point linkage with II and III Cat. interchangeable ball ends is standard supply.



WARNING: Always take great care when using or adjusting the three point linkage.

Hitching the implement

To allow the lift to operate in the correct way, you must carefully check the dimensions of the implements to be coupled to the tractor.

These couplings must be the same standard size as the three point linkage of the tractor to prevent the whole assembly from being subjected to irregular stress during work, caused by dimensional incompatibility. See dimensions given in Fig. 4-64.

Weight of the implement

To prevent the regular operation of the lifting system from being impaired, the weight of the implements must be less than the maximum load the lift can raise. This value (given in the specifications) is only indicative, since the distance at which the center of gravity of the implement is set in relation to the three point linkage can also exercise a notable influence.

If an implement, even when lighter than the indicated weight, is set at an excessive distance from the tractor, it will bear down on the three point linkage with a much greater weight than the weight of the implement itself.

Three point linkage

The articulated device with three point suspension mainly consists of the following components (Fig. 4-65):

Adjustable top link (3rd point)

The adjustable top link (1 - Fig. 4-65) is connected to the support by two holes. The correct hole to use depends on the height of the implement.

Adjust the length of the top link to vary the attachment angle of the implement in relation to the ground.

Shorten the top link to increase the angle of attachment, lengthen it to reduce the angle of attachment.

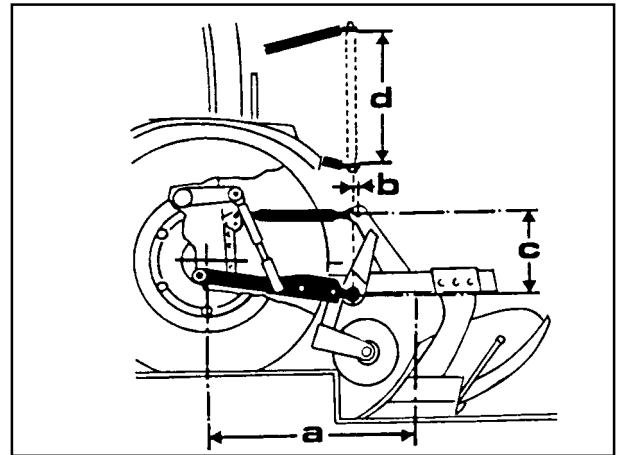


Fig. 4-64

Implement hitch dimensions.

a- Distance from the center of gravity of the implement.

As short as possible (the heavier the implement, the shorter the distance must be).

b- Retraction of the third point: from 0 to 80 mm (0 to 3.1 in.)

c- Height of top link hitch ball: 500-600 mm (19.7 to 23.6 in.)

d- Length of bar: 825+1.5 mm (32.5 in.)

NOTE: The plough shown in the figure is purely indicative since the dimensions are valid for any type of implement.

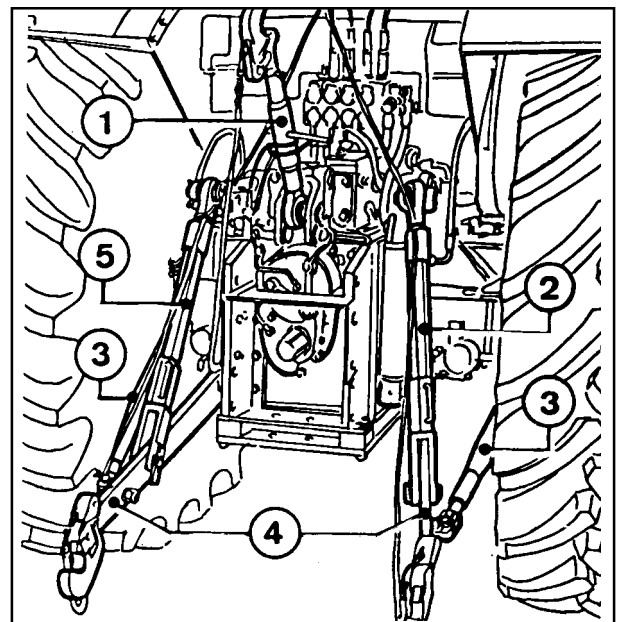


Fig. 4-65

Mechanically adjusted three point linkage (2nd Class).

1 - Top link with length adjuster sleeve.

2 - Rh vertical lift rod with regulating device.

3 - Side stabilizers (2).

4 - Lower links.

5 - Lh vertical lift rod with length regulating device.

Operation

During work, the top link must slowly drop towards the tractor, when the lower links are parallel to the ground.

A hydraulically regulated 3rd point top link can be supplied on request (6 - Fig. 4-66). This allows the operator to adjust the length from the driving seat.

Adjustable RH lift rod

The right-hand lift rod (2 - Fig. 4-65) can be adjusted in length by means of a lever (2). This adjustment is very useful since it allows the implement to be levelled according to the job in hand.

Turn the lever clockwise to shorten the right-hand lift rod.

Turn the lever anticlockwise to lengthen the right-hand lift rod.

On request, the RH lift rod can be equipped with a hydraulic adjuster device operated from the driving seat (7 - Fig. 4-67).

Vertical lift rods

The right and left vertical lift rods (2 and 5 - Fig. 4-65) can be regulated by means of an adjustment crank in order to alter the lateral angle of the implements. They can also be adjusted by turning the backing plate through 90°: this gives two settings, one with the plate fixed (Fig. 4-68), the other with the plate free to slide (Fig. 4-69). This latter position must be used for implements that require a certain freedom of sideways movement (cultivators, spaders, harrows).

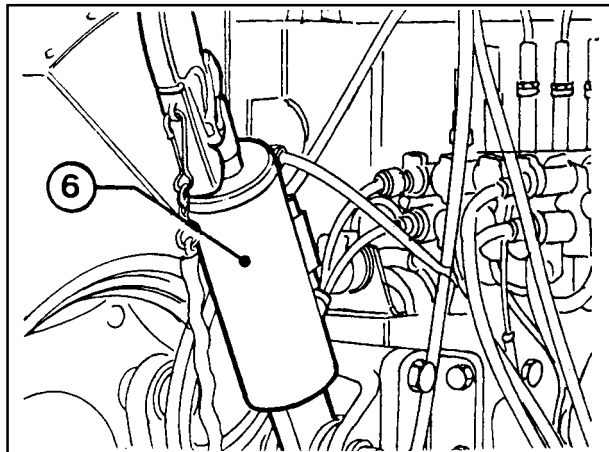


Fig. 4-66

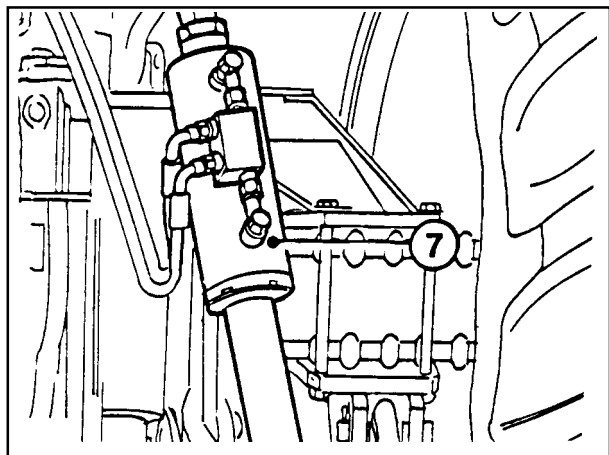


Fig. 4-67

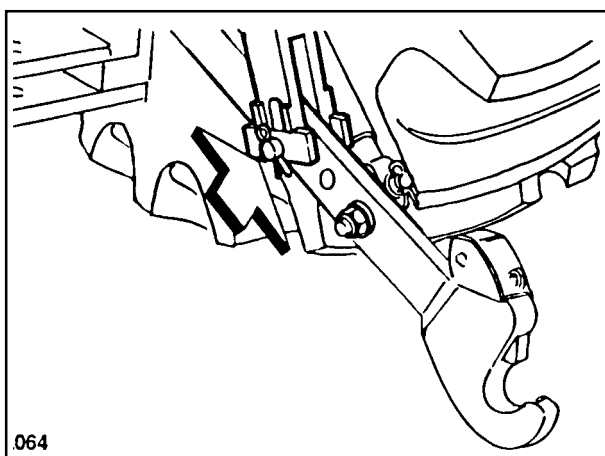


Fig. 4-68

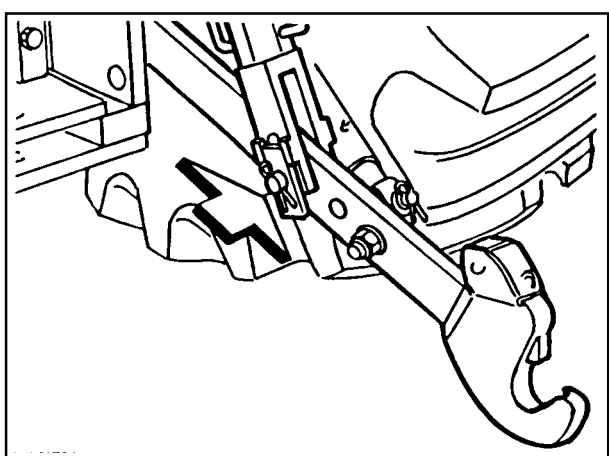


Fig. 4-69

Lower links

The lower links (4 - Fig. 4-65) transmit tractive force and support the implement.

They are equipped with quick-hitch couplings for attaching the implements (Fig. 4-70).

The tractor is supplied with Cat. 2 and 3 interchangeable ball-ends to fit to the crossbar on the implement.

Quick hitch couplings

To hitch an implement, release the hook lock (2 - Fig. 4-70) by pulling the connecting cables (1) from the driving seat.

Reverse the tractor until the couplings are in the direction of the ball-ends previously mounted on the crossbar of the implement.

Slowly raise the lift links until the ball-ends push against the spring-loaded quick-hitch couplings (3) and are locked into place.

The couplings can be opened straight from the cab by means of the control cables.

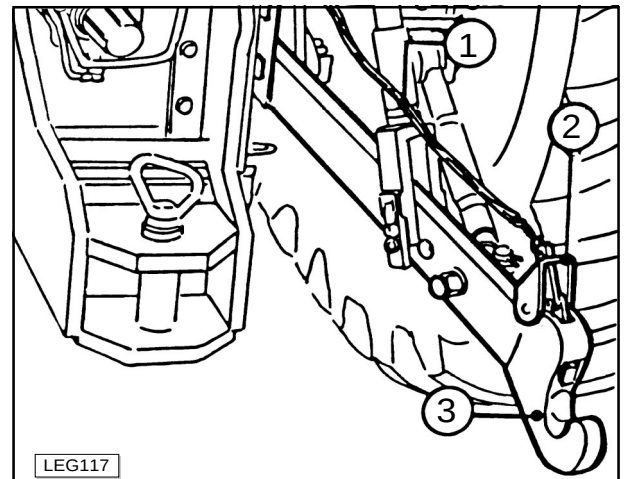


Fig. 4-70

Important recommendations when using and regulating the three-point linkage.



WARNING: Always stop the engine before making any adjustments to the three-point hitch or the implement.



WARNING: Always use the lift in position control mode when transporting implements hitched to the three-point linkage.



WARNING: Always use the lift in position control mode when an implement is hitched or unhitched to or from the three-point linkage.



WARNING: When the tractor is stopped, always lower any implements connected to the three-point linkage.



WARNING: Never ever work under an implement kept raised by the hydraulic lift alone. Always block it safely with a suitable support and turn off the engine.

Side stabilizers

The side stabilizers (3 - Fig. 4-65) can be set to reduce the lateral movement of the lower links of the three point linkage.

When work is carried out with certain implements such as graders, rollers, hoes, seeders, etc., adjust the stabilizers to restrict the side swing of the lower links.

With other implements such as ploughs, harrows, etc., the stabilizers can be set to allow for a greater freedom of movement.

When driving on roads with the power lift in the raised position, side swing must be limited whichever setting was previously used during work.

To adjust the stabilizers (3 - Fig. 4-65):

- Turn anti-clockwise to increase lateral swing.
- Turn clockwise to reduce lateral swing.

When the three-point linkage has been adjusted to floating mode, make sure that the implement swings to the same extent on both sides, using the edge of the rear wheel rim as a reference.

Push the three-point linkage as far as it will go towards the right and measure the distance between the lower link and the rim.

Operation

ELECTRONICALLY CONTROLLED HYDRAULIC POWER LIFT

Description

The electronically controlled hydraulic power lift is available as an option on certain tractor models, depending on the requirements of the particular market.

Electronic control of the power lift gives a number of major benefits. In particular, control and response signals can be processed and action taken to adjust for variations in ground conditions encountered by the implement in a fraction of the time possible with manual controls.

To obtain the best results from the electronic control system, you must be fully familiar with the controls on the power lift control panel. A full description is given below.

Power lift control panel (Fig. 4-71)

- 1 - 3-position up/down switch.
A: Lifting - Transport: the fully raised position is established by the limiter (6).
B: Stop - The lift arms are unable to move in any way in the stop position.
C: Lowering - Work position. This depends on the way the controls (8 and 10) are regulated.
- 2 - Button to activate the "Shock Absorber" device in the transport position.
- 3 - Transport shock absorber engaged indicator light.
- 4 - Down speed selector:
0 - Does not lower. Lock - Turned in an anti-clockwise direction.
Max. - Fast descent - Turned clockwise.
- 5 - Electronic power lift "Check Control" indicator light.
- 6 - Maximum height limiter:
Minimum height: turned anti-clockwise.
Maximum height: turned clockwise.
- 7 - Function selector:
 - Position Control, turned anti-clockwise.
 - Draft Control, turned clockwise.
 - Intermediate position: mixed Draft and Position Control (INTERMIX).
- 8 - Up movement indicator light.
- 9 - Down movement indicator light.
- 10-Implement work depth/height control:
0 - Maximum depth.
10 - Max. height from ground.
- 11-Quick soil engagement orange button.
- 12-External power lift controls - Buttons on the fenders (Fig. 76).

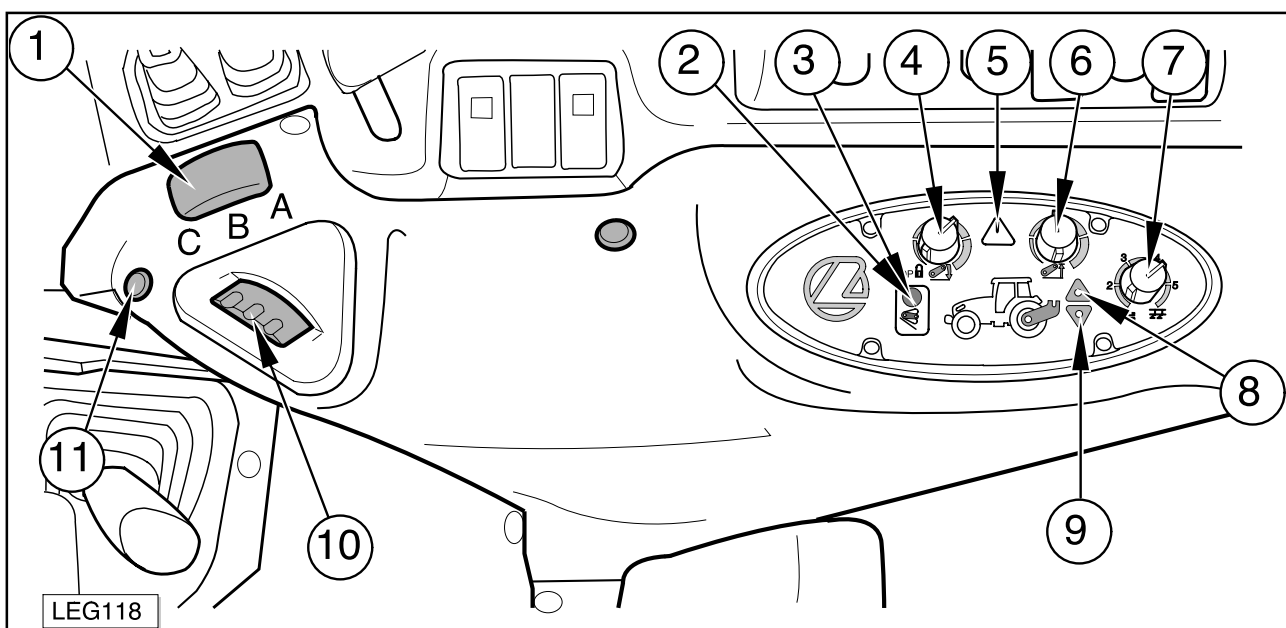


Fig. 4-71

USE OF THE ELECTRONIC POWER LIFT

Enabling the power lift (Fig. 4-72 and 4-73)

The power lift incorporates a safety device which disables the hydraulic power lift controls when the engine is off or if the external controls have been used. This prevents accidental movement of the lift arms and links as a result of interference with the controls or settings while the tractor was stopped. When the engine has been started, or after the external controls have been used, simply turn the control switch (1) to position A.

- If the switch is already in Pos. A, turn the switch (1) to Pos. C then back to Pos. A again.
- If the switch (1) is not in Pos. A and the lift is lowered, turn switch (1) to Pos. A.



WARNING: The lift arms will rise as soon as the control panel is enabled. Limit the max. lifting height with the control (6 - Fig. 4-725) before re-activating the electronic power lift.

- If you need to stop lift movement immediately, simply turn the switch (1) to Pos. B.
- Before you enable the power lift controls, check that the settings of controls (10 - Fig. 4-73 and 7 - Fig. 4-72) do not cause any dangerous movement of the implement.

NOTE: The electronic power lift control system also incorporates safety devices which disable the lift functions if any of the following faults are detected:

- 1 - Insufficient battery power.
- 2 - Short circuit in the power line.
- 3 - Position-control circuit malfunction.

If the electronic power lift fails to operate correctly after the controls have been enabled as instructed above, have the circuits checked by your local dealer.

Check-control indicator light

When the engine is started, the check-control indicator (5 - Fig. 4-72) lights up. Once the electronic power lift is enabled as already described, the check-control indicator should go out.

If the indicator lights up and flashes during work, consult your local Dealer who will be able to locate the fault.

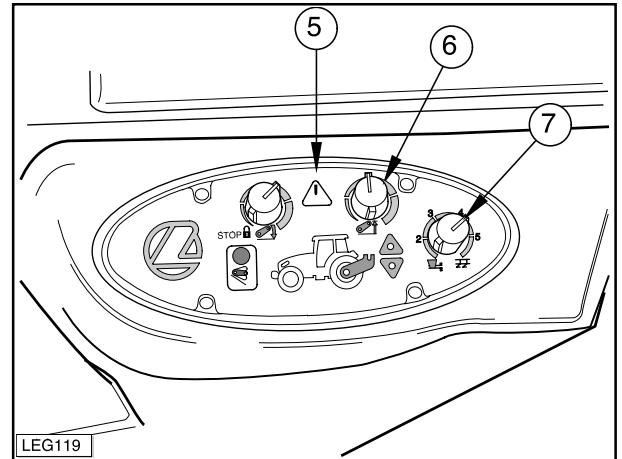


Fig. 4-72

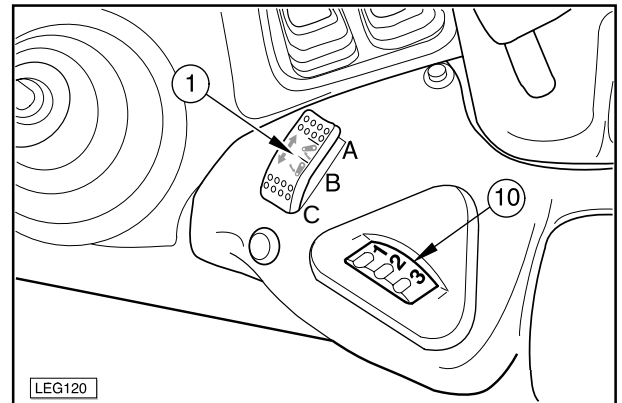


Fig. 4-73

Operation

Hitching an implement

From the internal control panel (Fig. 4-74 and 4-75)

- Turn the power lift control switch (1) to Pos. A to enable the power-lift control panel.
- Turn the control switch to the working position (C).
- Turn the function selector (7) anti-clockwise to select position control mode.
- Turn the knob (10) anti-clockwise to lower the arms. The arms-down indicator (9) should light up.
- Manoeuvre the tractor to the right position and hitch the implement's ball-ends on to the ends of the links. Fit safety pins to secure the hitch. Hitch up the top link.
- Turn knob (10) clockwise to raise the implement. The arms-up indicator (8) should light up.

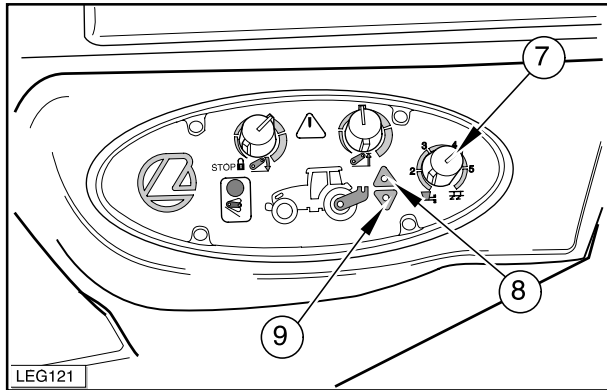


Fig. 4-74

With the external control buttons (Fig. 4-76)

There is no need to enable the power lift in order to use the external control buttons (12 - Fig. 4-76).

To use the external controls, just press on the buttons to raise or lower the lift arms. Now enable the power lift control panel by means of the switch (1 - Fig. 4-75).

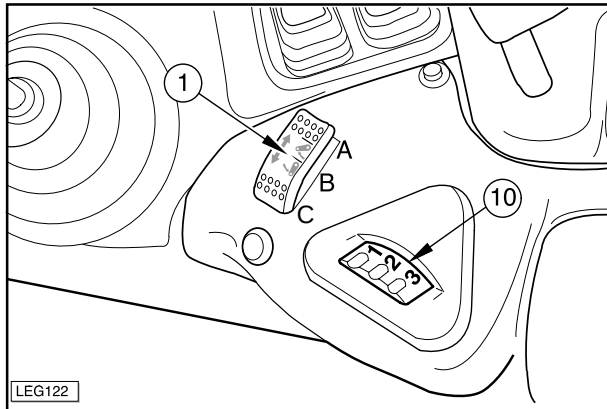


Fig. 4-75

NOTE:

- Arm movement stops as soon as the buttons are released.
- Descent speed is 30% slower than max. speed with the external controls. Down speed regulation remains disabled.
- To enable the control panel controls after the external ones have been used, release the safety device by setting the switch (1 - Fig. 4-75) to Pos. A and then to working position (C).



WARNING: Always stand at a safe distance from the implement and the three-point linkage when operating the external control buttons.

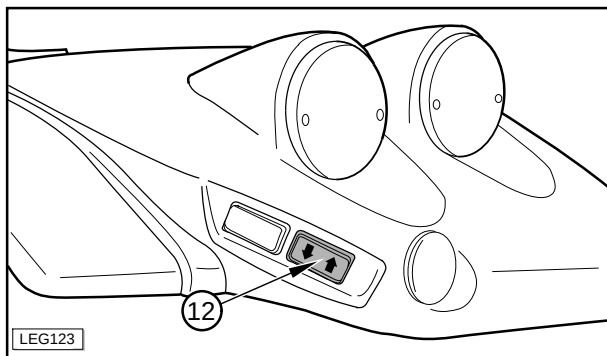


Fig. 4-76

Transporting implements (Fig. 4-77)

- Select the maximum transport height with the selector (6).
- Raise the three-point linkage by turning the switch (1) to Pos. A.
- Set the selector (7) to position control mode (Pos. 1) by turning it in an anti-clockwise direction.
- Set the down-speed selector (4) to position (0) (lock) to prevent any accidental lowering movement should the controls be accidentally operated.



WARNING: If the control lever (1) is moved to the links down position (C) and the work height control knob (10) is moved, the arms could be lowered. Set the lowering speed control (4) to Pos. 0 (lock) to prevent any accidental movement.

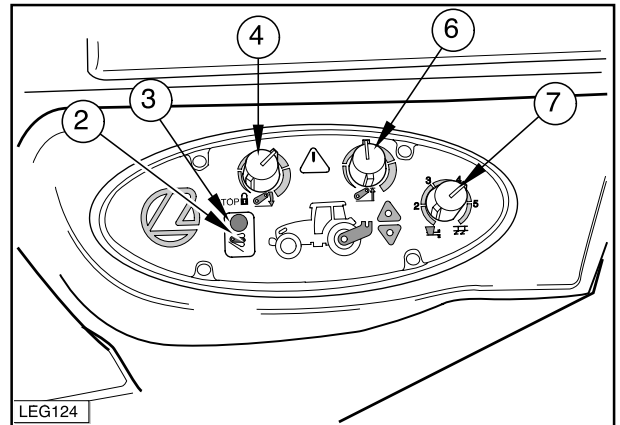


Fig. 4-77

Shock absorber function in the transport position (Fig. 4-78)

This function is activated by moving the selector (1) up (A) and pressing the button (2). Indicator light (3) will come on.

Press the button (2) again to deactivate the shock-absorber function in the transport position.

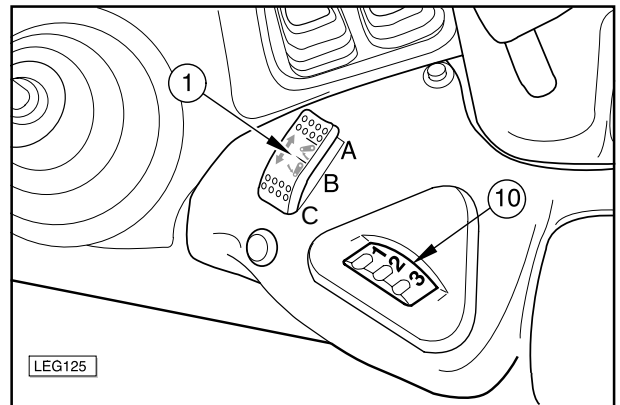


Fig. 4-78

Operating the power lift (Fig. 4-79)

- Select the power lift operating mode by means of the mode selector (7).

Position 1 Turn the knob anti-clockwise for position control mode. The implement will remain at a constant height or depth.

Position 6 Turn the knob clockwise for draft control mode. Use for ploughing and similar operations that require constant tractive force.

Intermed. positions (2 - 3 - 4 - 5) "Intermix" mode. Combining position control and draft control; for use on variable soils or with subsoilers, etc.

- Use the selector (4 - Fig. 4-77) to set a suitable descent speed for the type of implement being used.
- Set the switch (1) to working position (C).
- Turn the control knob (10 - Fig. 4-78) to obtain the correct working depth/height.

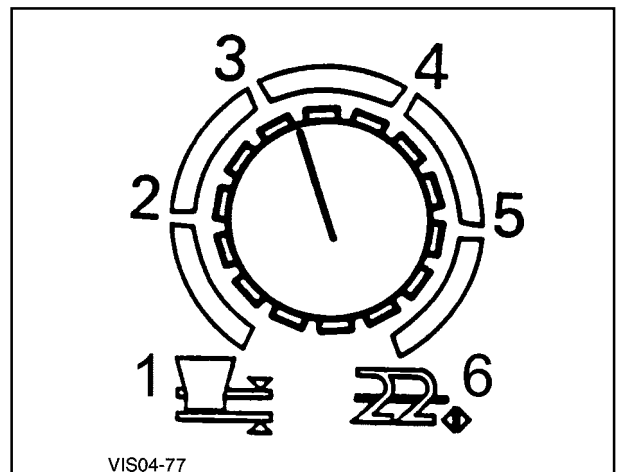


Fig. 4-79

Operation

Working with tillage implements (Fig. 4-80)

(Fig. 4-80)

- If the implement pitches (makes large lifting and lowering adjustments) in draft control mode, turn the mode selector knob (7) anti-clockwise to introduce an element of position control (Intermix). The sensitivity of the electronic power lift to variations in the traction force required in working conditions is automatically controlled and thus the operator need not intervene to make corrections.

Intermix/draft/position control adjustments (Fig. 4-79)

Tillage work: position 3 or 4.

Ploughing: positions 3 - 4 - 5.

Light soil turning: positions 2 - 3.

Grubbing: position 3 or 4.

Carried implement: position 1 (position control).

These settings are purely indicative and may vary depending on the implement used and the soil.

Headland manoeuvres (Fig. 4-80 and 4-81)

- Raise the implement at the end of the field by setting the switch (1) to Pos. A. The arms lift to the height set on the lift height limiter (6). Adjust the lift height limiter so that if a drive shaft is connected between the PTO and the implement, it is not twisted into acute angles. This will also avoid wasting time lifting the implement to transport height.
- To re-engage the implement, simply turn the switch (1) to the working position (C). The implement will lower at the speed set with selector (4) until it reaches the position selected with knob (10).
- To make the implement quickly re-engage the soil, press the orange-colored button (11).

Float mode (Fig. 4-81)

Used for implements that rest on the earth and follow the relief of the ground.

- Turn switch (1) to position (C).
- Turn knob (10) to position (10), fully anti-clockwise as far as it will go.



WARNING: Comply with the maintenance and safety regulations governing the electrical system of the tractor to safeguard and protect the electronic power lift.

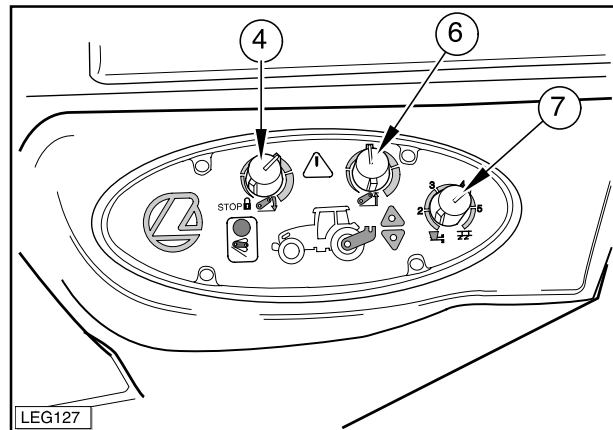


Fig. 4-80

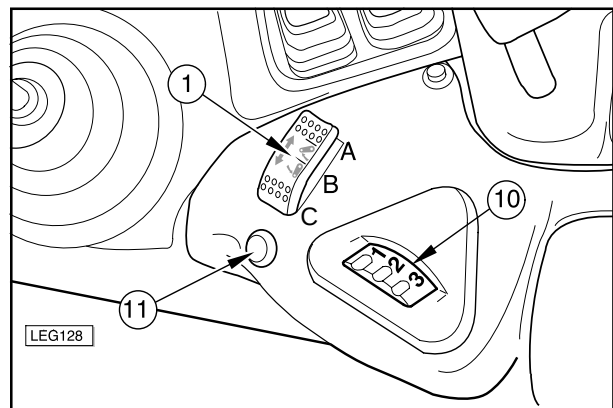


Fig.4-81

ELECTRONIC POWER LIFT CONTROL - OPERATING TABLE SUMMARY

(See Fig. 4-71 for the references)

OPERATION	HEIGHT LIMITER (3)	LIFTING-LOWERING SWITCH (1) QUICK SOIL ENGAGEMENT (11)	WORK DEPTH/ HEIGHT CONTROL (4)	MODE SELECTOR (6)	LOWERING SPEED (5)	NOTES
Enabling control	Pos. 0 - Minimum	Pos. A to Pos. C or Pos. C to Pos. A	—	—	0 - Minimum	Use controls (4) and (6) to prevent arm movement
Hitching or unhitching implements using the controls on the panel	Max. height pos. Turn clockwise	Pos. C work	Set to desired height	Position control Up: fully anti-clockwise	Set to intermediate pos.	—
Hitching or unhitching implements using external controls	Not used	Pos. B or C	—	—	—	Re-enable control panel after use
Transporting implements	Max. height Turn anti-clockwise	Pos. A - engage locking device (2)	—	—	Pos. 0	—
Working in position control mode	Set to max. desired height	Pos. C - work	Set to desired height / depth	Up: fully anti-clockwise	Set to desired position	Use switch 1 for headland turns
Working in draft control or Intermix mode	Set to max. desired height	Pos. C - work	Set to desired depth	Down: fully clockwise Intermediate positions for Intermix	Set to desired position	Use switch 1 for headland turns
Headland turns	Set to max. desired height	Pos. A	—	—	—	Do not change any work settings
Start of furrow	—	Pos. C - Surface work Button (11) - Quick soil engagement	—	—	—	Do not change any work settings

Operation

Mechanically controlled hydraulic power lift

Description of controls - Fig.4-82A

The lift link levers are provided with symbols to inform the operator about the correct lever position for each function.

1 - Lift link control lever.



The lift links are completely down when the control lever is in this position



The lift links are completely up when the lift links are in this position.

2 - Selector lever for draft control, position control, and mixed draft and position control (INTERMIX).



Lever at end of forward travel = full draft control zone



Lever at end of backward travel = full position control zone.

INTERMIX

Lever between the two end-of-travel positions = mixed draft and position control zone divided into two parts:
blue zone = position control increases as the lever nears the end of front travel position
red zone = draft control increases as the lever nears the end of back travel position.

3 - Nut to lock lever (1).

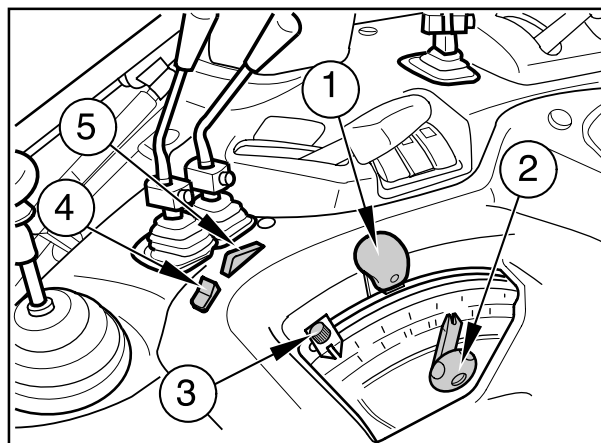


Fig.4-82A- Control levers of mechanical lift and parking brake lever (1).

1 - Lift link control lever.

2 - Selector lever for draft control, position control, and Intermix.

3 - Nut to lock lever (1).

A - Automatic up/down buttons (if installed - available on request in some markets only).

Up/down buttons to automatically raise/lower the lift arms - If installed Fig.4-82B

(On request on some markets only)

1. Up button
2. Down button

To lower the implement, fully depress the button (2), The lift arms will lower to the stop previously set by the control lever (1) Fig. 4-83.

To raise the implement, push the button (1) Fig. 4-82B back as indicated by the arrow to release the button (2). The lift arms will raise to the upper stop.



WARNING: *If the mounted implements you are working with are connected to the PTO and require the use of the automatic up/down control, the lift rods should be adjusted to the maximum length to avoid any damage to the drive shaft.*

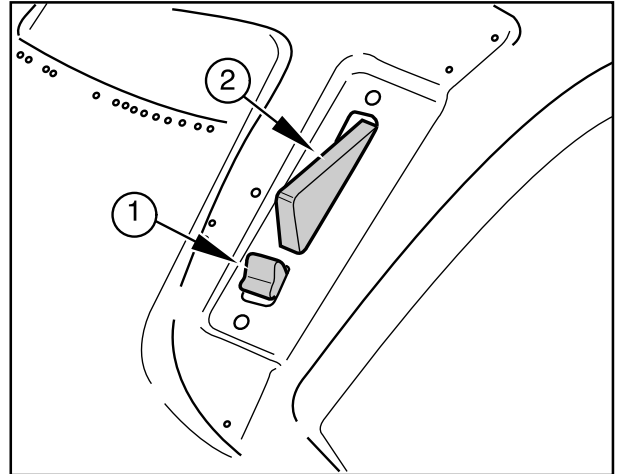


Fig.4-82B- (If installed - On request on some markets only)

Work in position control mode

Position control mode allows the implement to be brought to and kept in a certain position, whichever this may be. This includes the highest and lowest positions either in or out of the soil.

Position control mode is used for:

- Mounted implements, i.e. without wheels or other components allowing them to rest on the ground (e.g.: graders, scrubbers, drills, fertilizer-spreaders, etc.).
- Semi-mounted implements, i.e. equipped with wheels or other components allowing them to rest on the ground (e.g.: rotary ploughs, trenchers, weeders, seeders, etc.).

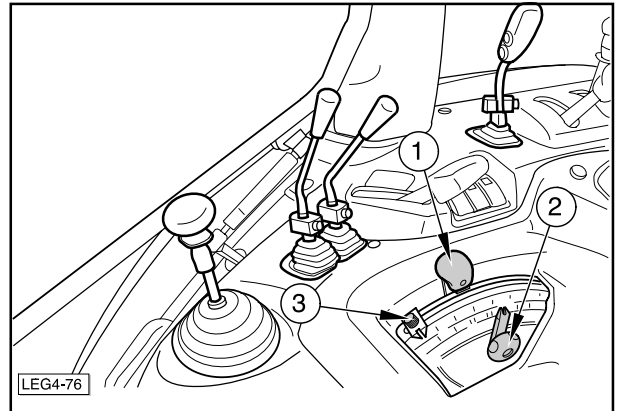


Fig.4-83

Use of controls (Fig. 4-83)

- Move the lever (2) fully back to the position control setting.
- To regulate the work position of the implement, progressively move the control lever (1) downwards or upwards until the desired position has been reached and then lock the check nut (3) under the lever itself to obtain the same work position on each run.
- At the end and the beginning of each run, use the automatic up/down buttons (if installed - Fig. 4-82B).

Operation

Work in draft control mode

Lift operation in draft control mode automatically keeps the tractive force of the tractor at a steady rate regardless of variations in the soil conditions.

Draft control mode is used with all mounted tractor implements which do not rest on the ground (e.g.: with skids, wheels, etc.) (Fig. 4-85).

Use of controls - Draft control mode (Fig. 4-84)

- Move the selector knob (2) fully forward to the draft control function.
- To dig the implement in quickly at the beginning of the furrow, move control lever (1) progressively forward. After this, lift it gradually to set to the desired work depth. The depth reached by the implement is proportional to the extent of lever travel.
- When the desired position has been reached, lock the lever with the check nut (3) to obtain the same work position on each run.
- Move control lever (1) back to raise the implement at the end of each run. Use the automatic up/down buttons, if installed.
- When shallow depths are required, the control lever travels only a very short length. To avoid that the implement digs in too slowly, it is better first to bring the lever fully forward at the beginning of each run over the check nut (3). After this, bring the lever progressively back to the desired position, once again over the check nut (3).
- At the end and the beginning of each run, use the automatic up/down buttons (if installed - Fig. 4-82B).

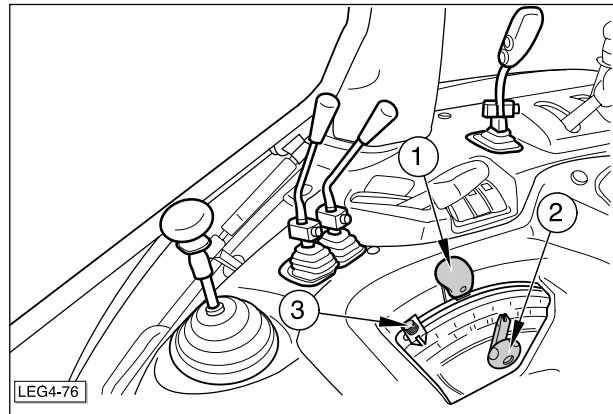


Fig.4-84- Top

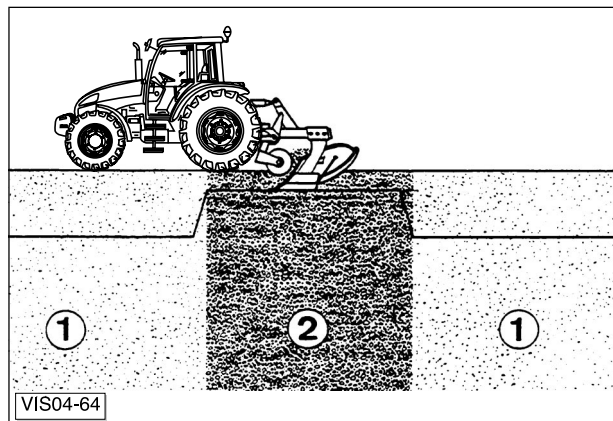


Fig.4-85 Lift in full draft control mode (selector lever fully forward). The work depth of the implement may vary considerably depending on the consistency of the soil (e.g.: zone 1 = normal soil, zone 2 = very hard and compact soil), while the depth remains more or less uniform when the types of soil are similar (zone 1), either on the flat or with humps and hollows.

Mixed position and draft control (Intermix)

When the lever (2 - Fig. 4-86) is moved completely forwards, the lift will operate in full draft control mode, while full position control mode is obtained by moving the lever completely backwards. When the lever is placed in any intermediate position, the lift operates in **Intermix** mode, that is in a mixed draft and position control mode.

The lever can assume as many positions as there is space between the two ends of the sector. Its proximity to the front or rear part influences draft or position control to a greater extent, as shown in the examples.

The operator must therefore identify the best position for the selector lever according to the type of soil being worked, thus obtaining the best compromise between draft variations and depth.

Work best carried out in mixed position and draft control mode (Intermix) (Fig. 4-87)

Work with the plough

- When working soils of strongly different types (sandy zones mixed with clayey ones) where full draft control could lead to excessive depth variations.
- When shallow depths are required.
- To achieve the best work conditions with semi-mounted ploughs with several shares.

Work with other implements

Whenever a certain draft control is required to obtain a more regular draft from the tractor. A certain measure of controlled draft causes variations in the work depth. Thanks to such variations, the tractor's draft power is steadier.

Floating position

This position is used for implements that must simply rest on the ground and follow its contours (e.g.: roller, seeder, etc.).

In this case, the lift links are completely free to swing and the lift just lowers and raises the implement at the beginning and end of the run.

Use of the lift in float mode is obtained by setting the lever (2 - Fig. 4-86) fully back in the position control setting and the link control lever (1) fully forwards. Just use the control lever (1) to lift or lower the implement.

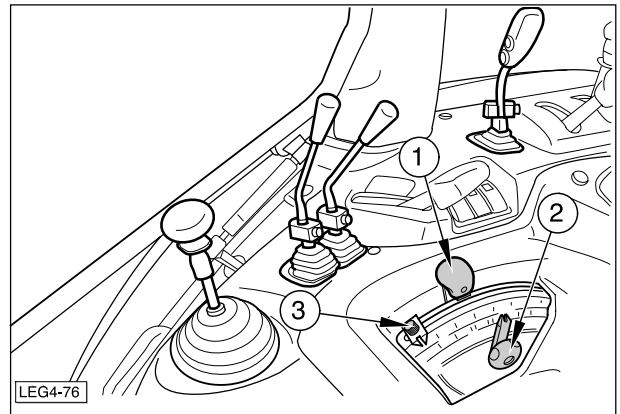


Fig.4-86 - Top

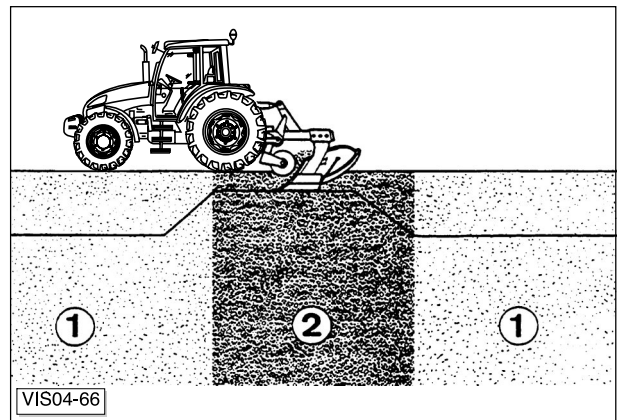


Fig. 4-87 Lift in «Intermix» mixed position and draft control mode. The maximum and minimum work depths of the implement are limited to the average work value (e.g.: zone 1 = normal soil, zone 2 = very hard and compact soil) since movement of the lever towards position control mode has reduced the operating sensitivity of draft control mode and has partially activated position control.

Operation

Max. lifting capacity of hydraulic power lift

The three-point linkage can be arranged in different ways to achieve either a greater lifting capacity or a greater freedom of movement.

All Legend models have two holes (A and B), (Fig. 4-88) used to hitch the vertical links.

The operator can therefore choose greater freedom of movement for the three-point linkage by using hole (A), which is nearest to the center point (A = 470 mm), or a greater lifting capacity by using hole (B), (B = 522 mm) which is farthest from the centering point but nearest to the end where the implement will be hitched.

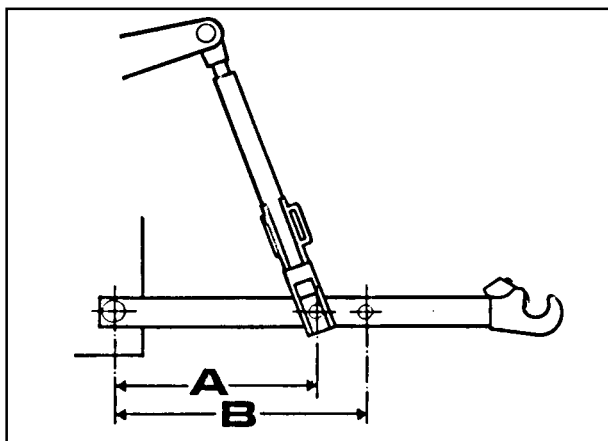


Fig. 4-81

MOD.	Cylinder diam. mm	Max. lifting capacity	
		A = 470 mm	B = 522 mm
125	90 STD	6500 Kg	7000 Kg
135	90 STD	6500 Kg	7000 Kg
145	90 STD	6500 Kg	7000 Kg
165	100 STD	7600 Kg	8400 Kg
185	100 STD	7600 Kg	8400 Kg

STD = Standard **OPT** = Optional

AUXILIARY CONTROL VALVES -

Top - Top-Tronic Fig. 4-89

The levers of the auxiliary control valves connected to the lift hydraulic circuit are mounted on the console on the right-hand side of the driver's seat.

Top - Three auxiliary control valves provided as standard, controlled by the joystick 1 and by the lever 2 (On request the control valve controlled by the lever 3). On request, control valve with hydraulic selector for top link and leveling ram, controlled by the lever 5.

Top-Tronic - Seven auxiliary control valves are standard. They are controlled by the joystick 1, by levers 2 and 3 and by lever 5 and are fitted with a hydraulic selector for top link and leveling ram to adjust the three-point linkage.

Joystick (1) - It is coupled to two auxiliary control valves. If shifted forwards, it controls the 1st valve, if shifted laterally it controls the 2nd valve. The lever can be locked by (8) in three positions:

- Turned anti-clockwise and downward: Every movement of the lever is locked in neutral.
- Turned clockwise and in intermediate position: The movement forward/back is allowed to control a single control valve. To control the second control valve, the locking device must be pulled up and the lever shifted laterally.
- Turned clockwise at the end of travel: The lever can be moved in every direction and controls both valves.

Lever 2 and lever 3 (on request the control valve controlled by the lever 3) are coupled each to its own control valve, with locking device 7 in neutral position.

Lever 5 (on request for Top) controls an auxiliary control valve connected to two quick couplings of the «Push-Pull» type with locking device 7 in neutral position.

The rocker switch (4) can have three positions: A-0-B.

Pos. 0 - The control valve lever feeds the rear quick couplings to activate external hydraulic rams (1 - Fig. 4-89).

Pos. A - The control valve lever controls the hydraulic top link.

Pos. B - The control valve lever activates the leveling ram to adjust the three-point linkage.

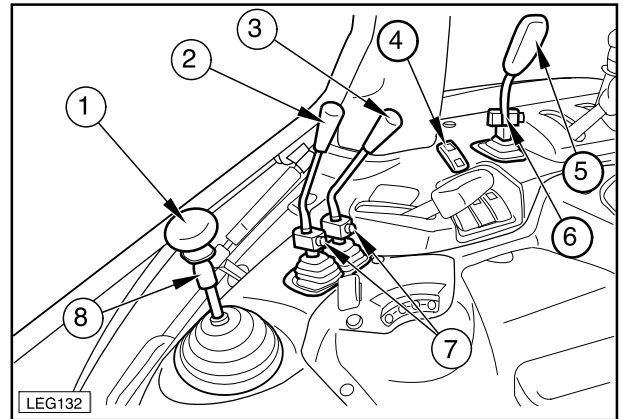


Fig. 4-89 - Top -Top-Tronic

NOTE: To ensure that the hydraulic circuit operates in a regular way, the level of the transmission oil must be frequently checked and topped up if necessary, as indicated in the "Checking the transmission oil level" part of the Maintenance chapter.

WARNING: Make sure that the hydraulic cylinders of the connected implements contain the same type of oil as the transmission unit of the tractor to prevent this from being polluted and leading to faulty operation.

Operation

“Bosch” control valve with flow regulation

When a Bosch control valve group (max. 5) is fitted, on request a maximum of three Bosch auxiliary control valves with flow regulation can be mounted.

The flow to each control valve is regulated by the knobs (1 - Fig. 4-90) placed behind the driver's seat.

Knob turned clockwise: reduces the flow to the linked auxiliary control valve.

Knob turned anti-clockwise: increases the flow to the linked auxiliary control valve to the maximum pump flow.

Quick couplings - Fig. 4-91

Each control valve has two quick coupling female half-connections of the “Push-Pull” type (1 and 2) that can be connected to male half-couplings of any make so long as they are of the same size. The half-coupling is very simple to couple and uncouple: push to connect and pull to detach (Fig. 4-91).

Red - Delivery/Lifting

Yellow - Return/Lowering

Oil sump - Fig. 4-91

Each quick coupling is connected to an oil sump (3) that collects oil leaks due to hitching and unhitching of the quick couplings. When the oil reaches the maximum level, the sump should be emptied in collecting tanks so as not to contaminate the environment.

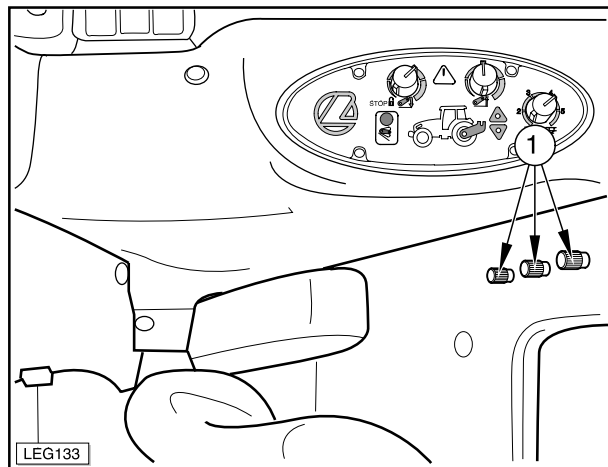


Fig. 4-90 - Bosch

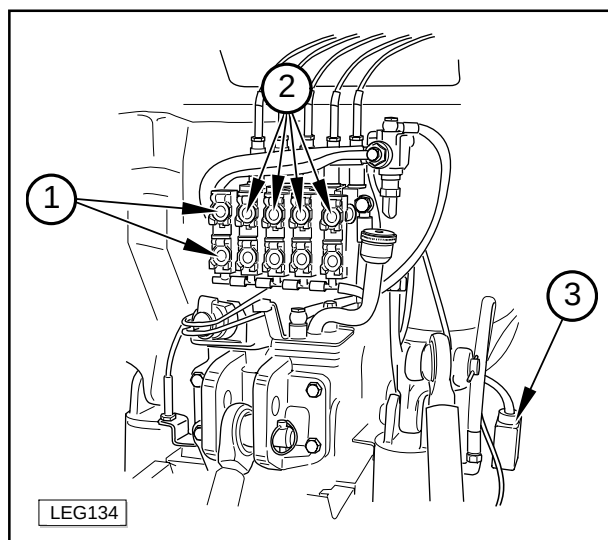


Fig. 4-91 - Bosch

FRONT LIFT (Available on request)



WARNING: Tractor circulation on the public highways with an implement hitched to the three-point front lift is only permitted in full compliance with the Highway Code regulations in the country in which the tractor is used.



WARNING: Refer to the description of the rear power lift in the tractor's Operation and Maintenance Manual for the general safety regulations governing use of the front lift.



DANGER: The symbol and the word DANGER are used to denote a hazardous situation which could lead to serious injuries and death unless avoided.



WARNING: The symbol and the word WARNING are used to denote a potential danger situation. SERIOUS PERSONAL INJURIES OR LOSS OF LIFE could occur unless the instructions or procedures are correctly carried out.



CAUTION: This symbol and the word CAUTION are used to denote special instructions or procedures which could lead to serious injuries unless they are strictly complied with.

Introduction

Hydraulic power lift with front three-point hitch and lifting/lowering operation. Class 2 three-point hitch (Fig. 4-92) with quick couplings.



WARNING: NEVER exceed the maximum tolerated load on the front axle of the tractor. Consult the "Technical Specifications" and ask your Dealer for information in merit.

Controls

One of the tractor's auxiliary control valve levers is used to control the hydraulic front lift.

The lever carries out the following functions:

- Lifting - Lever pulled back.
- Lowering - Lever pushed forwards.
- Float mode - Lever fully forwards



CAUTION: Consult the Operation and Maintenance Manual of your tractor for instructions about the position and use of the auxiliary control valve levers.

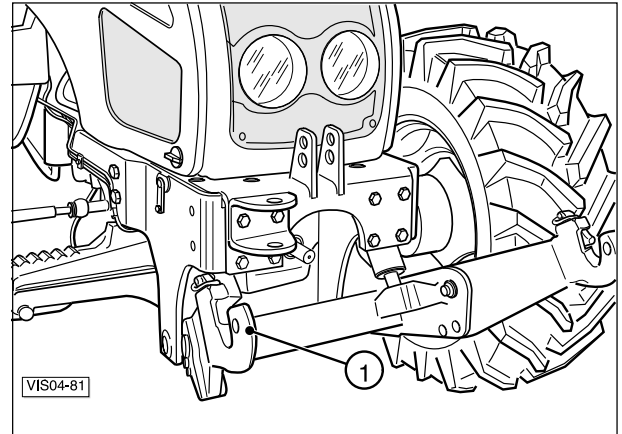


Fig. 4-92

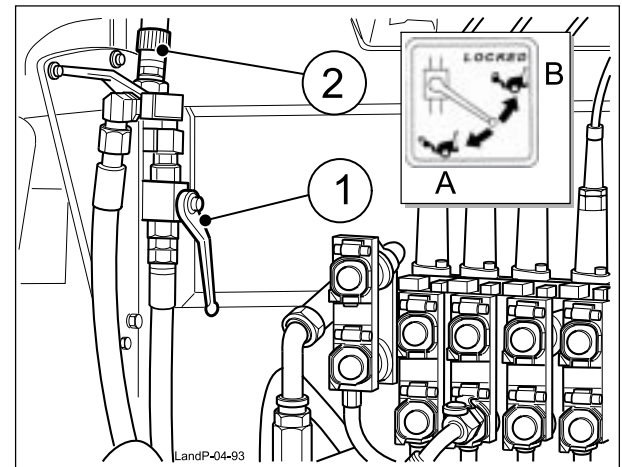


Fig.4-93

On-off cock

The power lift feed pipe has an on-off cock (1 - Fig. 4-93) to completely block the power lift when it is not used.

Pos. A - Open: work position.

Pos. B - Closed : position when lift is not used.



WARNING: Shut off the on-off cock when the front lift is not being used or is supporting an implement or front ballast during the transport phase.

Lowering speed adjustment

The implement lowering speed is adjusted by means of the adjustable valve (2 - Fig. 4-13).

Turn clockwise = to slow down

Turn anti-clockwise = to accelerate

Operation

Lifting capacity

Mod. 125 - 135:	1200kg
Mod. 145 - 165 - 185:	1600kg

Lift links

The links can be positioned to suit the job in hand. Once the lift links have been fixed in the required position, always remember to lock the fixing plugs with the relative safety pins.

Work position with fixed links (Fig. 4-94)

Plugs (1) fixed into the holes in order to keep the links in the fixed work position.

Lock the plugs in place with the safety spring pins.

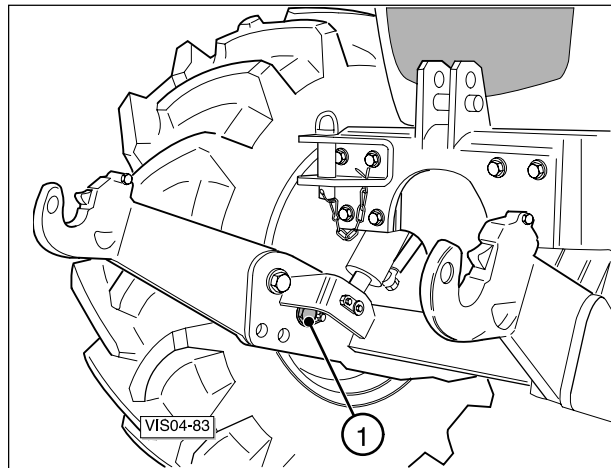


Fig. 4-94

Floating work position where the links can move as work proceeds (Fig. 4-95).

The plugs (1) should be fitted into the slot on the links to allow the actual links a certain freedom of movement.

Fix the plugs in place with the safety spring pins.

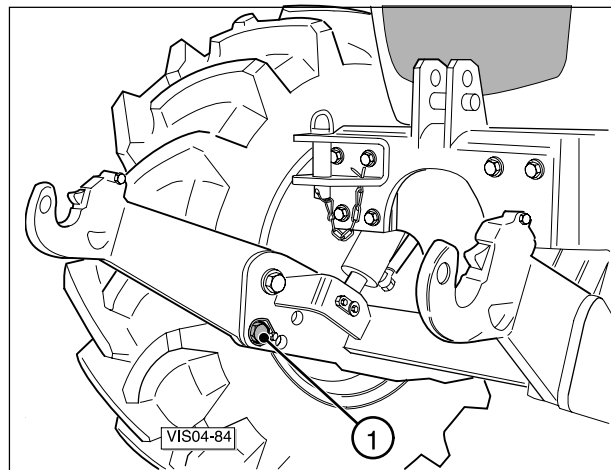


Fig. 4-95

Transport position when the lift is not used (Fig. 4-96).

Fix the plugs (1) in the hole that keeps the links in a vertical position. Now lock the plugs in place with the safety spring pins.

The third point can be folded as shown in Fig. 4-97 during the transport phase.

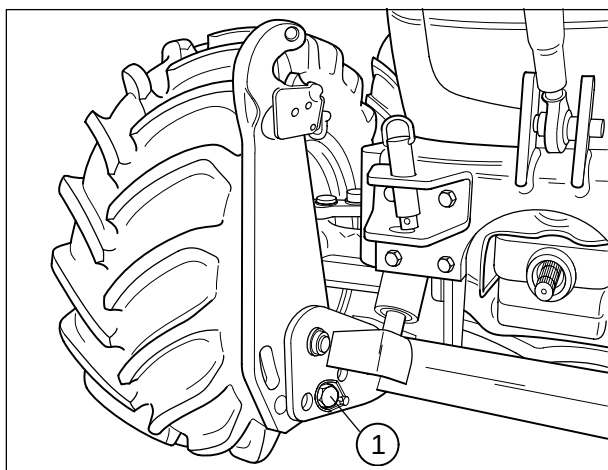


Fig. 4-96

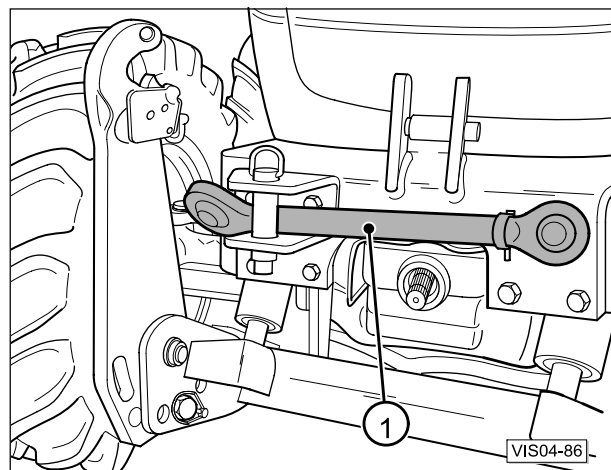


Fig. 4-97

Implement hitching

(Fig. 4-98)

- Position the lift links with the hitches fully open and right under the implement's hitching points.
- When the implement has been hitched, make sure that the safety tabs (1) have snapped into their closing position.
- Lift the links.
- Adjust the third point as described in the instructions given for the tractor's rear three-point hitch adjustments.

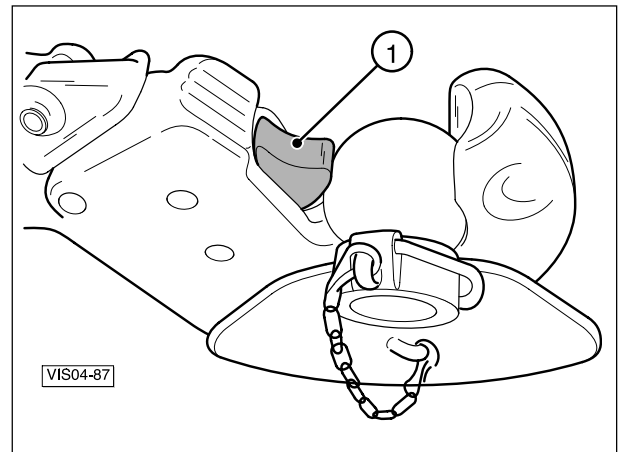


Fig. 4-98

Maintenance

Grease the grease nipples on the plugs (4 grease nipples) (1 - Fig. 4-99) after every 500 hours service, using grease of the prescribed type (see Fuels and Lubricants chart).



WARNING: When servicing work is required, lower the front lift to the ground and unbitch the implement. NEVER carry out servicing work by standing under the front lift.

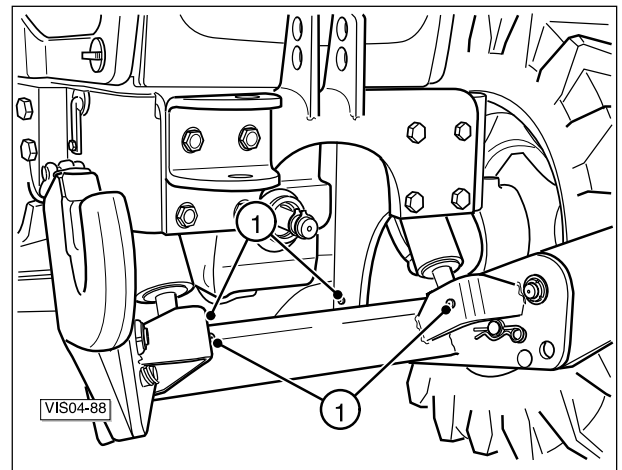


Fig. 4-99

Front ballast

Front ballast to apply to the lift links can be supplied on request (1 - Fig. 4-100).

Mod. 125 - 135:	300kg
Mod. 145 - 165 - 185:	600kg



WARNING: Use suitable lifting means when handling the ballast.



WARNING: When the ballast is mounted on the front lift links, lock the on-off valve (1 - Fig. 4-93) in position B to prevent the system from moving and swinging, particularly when driving on the roads at high speed.



WARNING: To mount/remove the ballast, insert a tube in the holes provided on the ballast itself (If fitted). Rest the tube on the lift arms to avoid any rotation when detaching the top link.

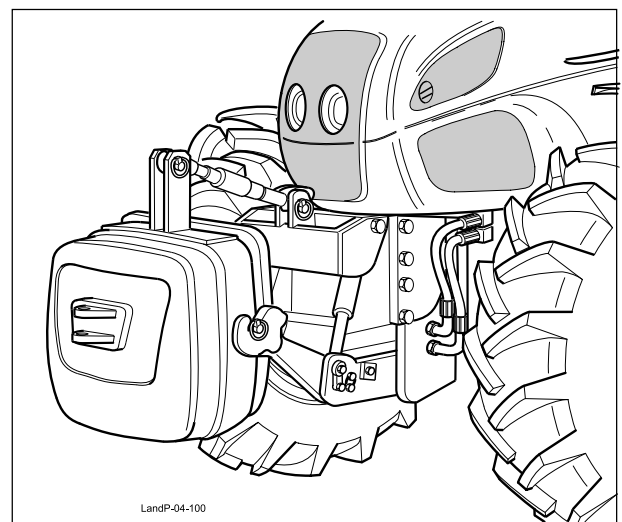


Fig. 4-100

Operation

FRONT POWER TAKE OFF SAFETY DECALS

See Fig. 4-101 for the position.

Decal 1

Fig. 4-102

Mounted for all markets

Affixed to the front support near the front PTO shaft.

WARNING: Keep well away from spinning shafts.

DANGER of entanglement.

The front PTO shaft spins at 1000 RPM in the direction shown by the arrow.



Fig. 4-102

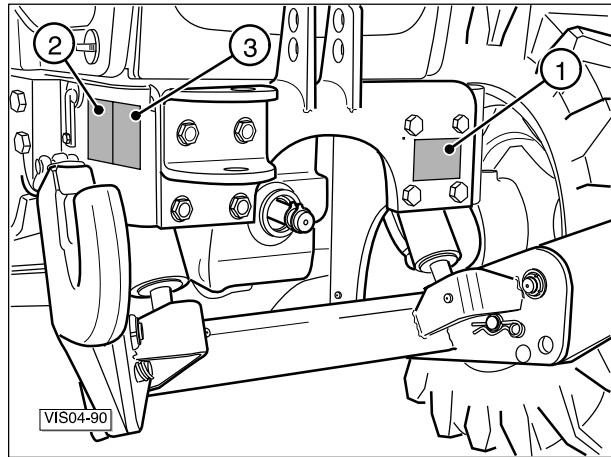


Fig. 4-101

SAFETY DECALS - WEO markets

See Fig. 4-101 for the position.

Decal 2

Fig. 4-103

Affixed to the front support near the front PTO.

WARNING: Take care. Read the Operation and Maintenance Manual for information about tractor safety and use.

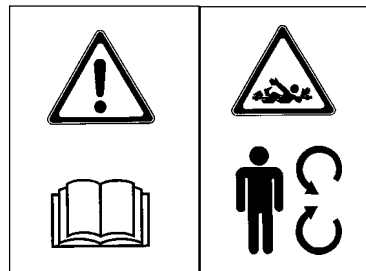


Fig. 4-103

DANGER: Risk of entanglement. Keep well away from spinning shafts. Take care NOT to be caught up by the PTO driveline. Keep all the shields mounted on the tractor or implement drive shafts.

SAFETY DECALS

North American markets - NAO

See Fig. 4-101 for the position.

Decal 3

Fig. 4-104

Affixed to the front support near the front PTO shaft.

WARNING: Take care. Read the Operation and Maintenance Manual for information about tractor safety and use.



Fig. 4-104

DANGER: Risk of entanglement. Keep well away from spinning shafts. Take care NOT to be caught up by the PTO driveline. Keep all the shields mounted on the tractor or implement drive shafts.

FRONT POWER TAKE OFF

(Mod.125-135-145-165) (Available on request)



WARNING: Refer to the description of the tractor's rear power take-off in the Operation and Maintenance Manual for the general safety regulations governing the front PTO.



DANGER: The symbol and the word DANGER are used to denote a hazardous situation which could lead to serious injuries and death unless avoided.



WARNING: The symbol and the word WARNING are used to denote a potential danger situation. **SERIOUS PERSONAL INJURIES OR LOSS OF LIFE** could occur unless the instructions or procedures are correctly carried out.



CAUTION: This symbol and the word CAUTION are used to denote special instructions or procedures which could lead to serious injuries unless they are strictly complied with.

Introduction

The front PTO has a 1" 3/8" (34.9 mm) output shaft with 6 splines that spins in an anti-clockwise direction (viewed from the front of the tractor) at a rate of 1000 RPM. (Fig. 4-105)

The output shaft is in a protected zone under the front support of the tractor and has a plastic cover that must only be removed when the implement is hitched to the PTO shaft.



WARNING: Always mount the plastic guard on the PTO shaft when the PTO is not being used.

Preparation prior to use

Make sure that the hydraulic oil cock (in front of the electrohydraulic valve gear unit that operates the front PTO) is open (1- Fig. 4-99).

Shut off the cock (1-Fig. 4-106) if the front PTO is not going to be used for a fairly long period of time.

Operation: Engagement/Disengagement

Press the switch to engage/disengage the front PTO (1- Fig. 4-107) with the engine at its top rate of 1000 RPM.

Pos. A - Front PTO disengaged, position "N".

Pos. B - Front PTO engaged

To engage the PTO, release the switch (1) by shifting the orange safety button (2) as indicated by the arrow, then pressing on side B of the switch.

Always set the switch in the disengaged position N (A - Fig. 4-107) after you have finished using the front PTO and/or before starting the engine.

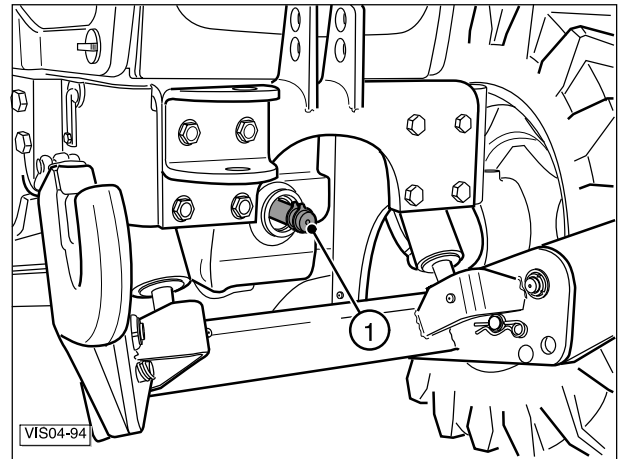


Fig. 4-105

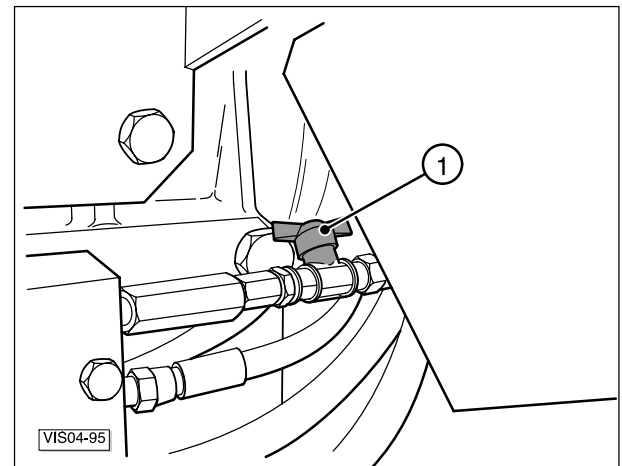


Fig. 4-106

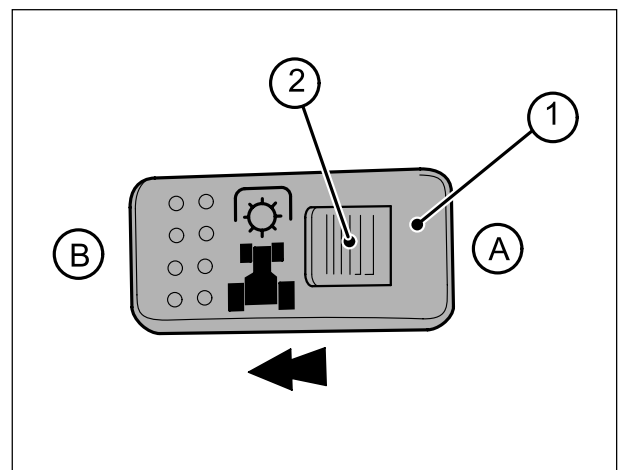


Fig. 4-107

Operation

IMPORTANT: do not hitch implements that require more than 58 kW (80 HP) to the front PTO.

IMPORTANT: When you use implements that transmit shocks and jolts, always mount a safety coupling between the implement and the PTO drive shaft. Before using the implement, check to make sure that the safety coupling works correctly and that the implement is able to operate without difficulty.

IMPORTANT: When you use implements with fast moving parts such as mowers, harvesters and snow ploughs, ALWAYS fit an overrun mechanism to the drive shaft of the implement in order to prevent the PTO from breaking down.

IMPORTANT: Make sure that the implement's PTO is not too long and that the PTO is not damaged when the front hitch is fully raised.

IMPORTANT: When you use implements like mowers, harvesters, etc., check and clean the front grilles of the tractor; the water radiator; the transmission oil radiator and the air conditioner radiator each day.



WARNING: Implements with a high degree of inertia do not stop immediately after the PTO has been disengaged. Wait until the implement slows down and comes to a complete stop before proceeding with cleaning operations or adjustments.

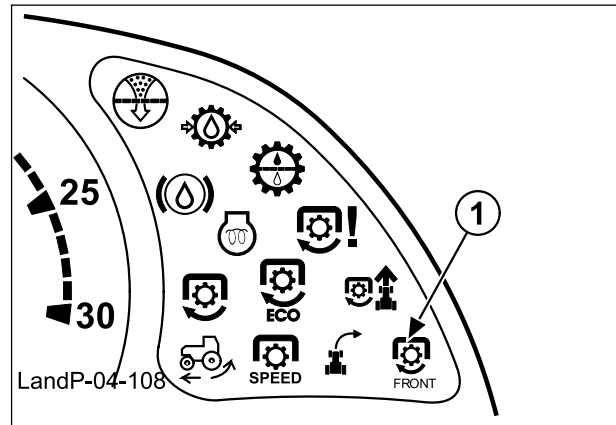


Fig.4-108 - Front PTO engaged indicator (if mounted) - orange.

Maintenance

Grease the indicated greasing points (3) with graphite grease of the Molykote GN Plus type at least once a year, depending on the conditions of use.

Fig. 4- 109 - For 6-cylinder engines up to 130 CV.

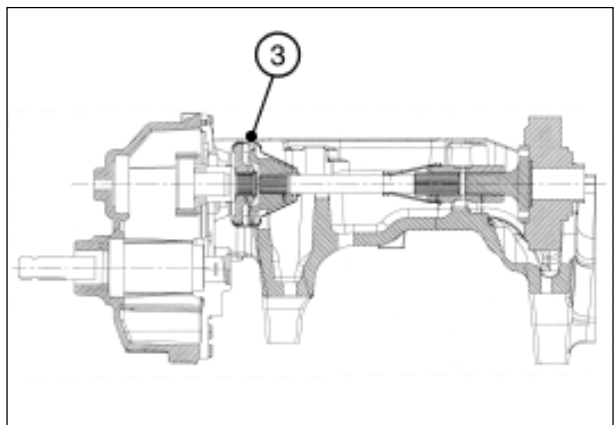


Fig.4-109- 6-cylinder engine up to 130CV

Tractor transport

Towing the tractor

If you need to tow or push the tractor for a brief distance, remember that the power steering system will allow you to drive and steer it for a short way with the engine off.

Put the following controls in NEUTRAL (Fig. 4-110 and 4-111):

- 1- Reverse shuttle lever (1 - Fig. 4-110)
- 2- Gearshift lever (3 - Fig. 4-110)
- 3- Range selector lever (4 - Fig. 4-110)
- 4- (With **Top-Tronic** only) Disengage the Park Lock (6 - Fig. 4-110)
- 5- Disengage the parking brake (5 - Fig. 4-110)
- 6A- Electrohydraulic PTO - Ensure that the PTO engagement switch (1 - Fig. 4-111) and the selector lever of the PTO speed are in disengaged position (2 - Fig. 4-111).
- 6B - Mechanical PTO - Make sure that both the PTO engagement lever (6 - Fig.4-110) and the PTO speed selection lever are disengaged (2 - Fig.4-111).

How to drive the tractor

- Slow and stop the tractor with the brake pedals latched together (2 - Fig. 4-110)
- Tow or push the tractor at moderate speed.

How to safely drive the tractor

- Affix the slow moving vehicle card (SMV-Slow Moving Vehicle).
- Use the revolving beacon and the hazard lights.
- Strictly comply with the laws in force in the country where the tractor is used.

Tractor transport

The tractor must be transported with a suitable vehicle (Fig. 4-112).

Engage the parking brake (5 - Fig. 4-110).

Engage the Park Lock (with **Top-Tronic** only) (6 - Fig. 4-110).

Firmly fasten the tractor to the transport vehicle using suitable chains or straps (Fig. 4-112).

Use the tow bar or its supports as rear fixing points for the tractor.

CAUTION: *Never hitch or connect chains around the tractor components as these could be damaged by the chains themselves or by excessive loads.*

The trailer must be provided with the warning signs and lights required by the local laws in force.

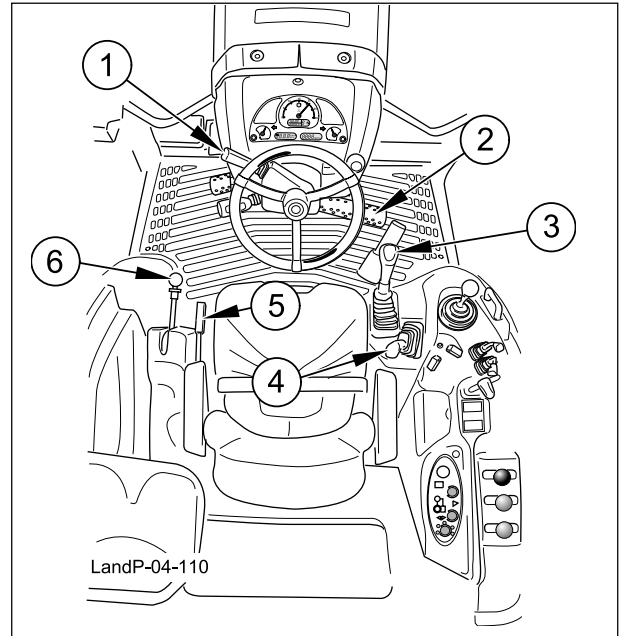


Fig.4-110

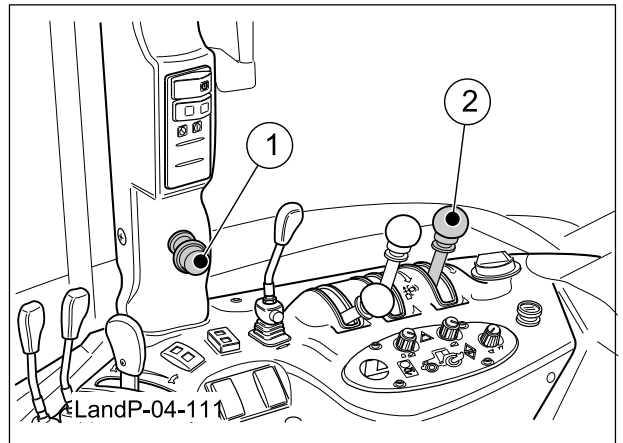


Fig.4-111

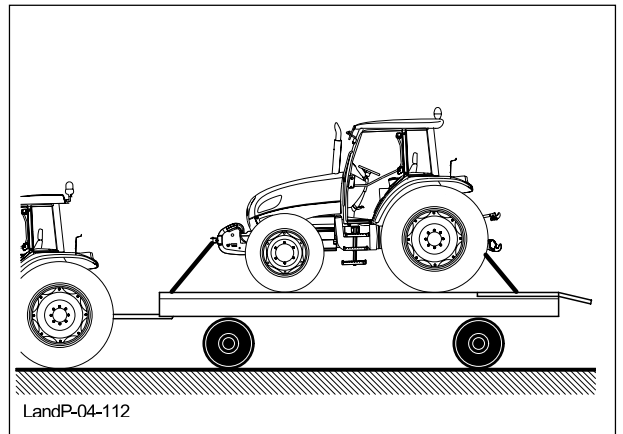


Fig.4-112

Operation

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Chapter 5 Maintenance

5

Maintenance

ROUTINE MAINTENANCE TABLE

PERFORM the following operations		AFTER THE FIRST	EVERY					REFER to
ASSEMBLY	DESCRIPTION	* 50 hours	100 hours	250 hours	500 hours	1000 hours ¹⁾	In maintenance guide Operation	
LUBRI- CATION	General lubrication		●				21 to 23	
	Lubricate three-point linkage	Variable					9	
	Lubricate rear axle bearings (Mod. 145-165-185 only)			●			30	
ENGINE (4)	Check engine oil level	Variable					4	
	Change engine oil	● *				●	26	
	Change engine oil filter	● *				●	27	
	Check valve clearance	○					28	
	Clean Intercooler for engine Legend 180	Variable					17	
FUEL SYSTEM	Clean fuel filter bowls	Variable					5	
	Change fuel filter cartridges	● *	● **		●		29	
	Check injector settings					○	41	
	Dry air filter: Clean drain valve	Variable					1	
	Dry air filter: Clean or change cartridge	Variable					2	
	Drain sludge from fuel tank					●	39	
COOLING SYSTEM	Check coolant level in radiator	Variable					3	
	Clean radiator fins	Variable					16	
	Wash out cleaning circuit					●	32	
TRANSMISSION - BRAKES HYDRAULIC CIRCUIT AND STEERING CIRCUIT	Check oil level in gearbox (steering and power lift circuits), front axle differential and front final drives	Variable					18-10-11	
	Change oil in gearbox ⁽²⁾ (steering and power lift circuits), front axle differential and front final drives				● ²⁾	●	33-34-35	
	Change oil filters on the intake ⁽³⁾ of the steering and power lift circuits	● *		●			24	
	Change oil filter on the delivery ⁽³⁾ of the steering circuit (and Top-Tronic circuit - if fitted)	● *		●			25	
	Clean transmission oil radiator	Variable					16	
	Check free travel of brake pedals	Variable					13	
		Variable					12-14	
ELECTRIC SYSTEM	Check oil level in brake and clutch circuits	Variable					6	
	Check level of electrolyte in battery	Variable					7	
	Check alternator belt tension	Variable					37-38	
	Check efficiency of alternator and starter motor					○	-	
CAB AND AIR CONDITIONING	Check level of screen wash liquid	Variable					15	
	Check and clean cab air filter	Variable					36	
	Change cab filter element					●	-	
	Check charge in air conditioning system	Variable					16-17	
	Clean condenser in air conditioning system	Flessibile					8	
	Check compressor belt tension	Variable					19	
OTHERS	Check tyre pressure	Variable					20	
	Check wheel nut tightness	● *					-	
	Check tightness of nuts and bolts in general	● *					-	

* During running-in period, after the first 50 hours.

**After the first 100 hours during running-in.

Operations marked "0" must be carried out by an authorized dealer or service agent.

(1) Operation to be carried out at least once a year. (2) It is advisable to change the oil (all models) after the first 500 hours work and then every 1000 hours (i.e. at 1000, 2000 hours etc.). (3) Change the filters on the intake and the filter on the delivery after the first 50 hours work and then every 250 hours (i.e. at 250, 500, 750, 1000 hours etc.).

(4) Change the closed circuit engine breather after the first 500 hours. The complete breather unit is to be replaced after 8000 hours or in case of engine overhaul.

CAUTION: Use your own discretion and experience when deciding the actual intervals for variable interval service and maintenance operations. Always remember however, that it is better to carry them out too often than not often enough.

MAINTENANCE

GENERAL INFORMATION

This section describes those maintenance operations which require specific instructions. Operations not requiring specific instructions are simply listed in the Routine Maintenance Guide.

This brief guide covers all the maintenance operations to be carried out at different intervals.

When it is stated that operations may be carried out at variable intervals, determine the actual intervals to suit the weather and the conditions your tractor has to operate in. Use common sense and experience!

Always carry out routine maintenance and lubrication operations at the intervals given in the Routine maintenance Guide.

Always refer to the tractor's actual operating hours as shown on the meter.

RUNNING IN

Constant efficiency and a long working life largely depend on how the new tractor is treated during the running in period.

It is therefore extremely important to follow these instructions:

- Your engine does not require any special running in when new. You can use it at full power from the start but you must never overload it. Avoid using the engine at full power before it reaches an operating temperature of at least 60°C (140°F).
- Every time you start the engine from cold, let it run slowly without load for a few minutes to warm up. This is particularly important with turbo-charged engines.
- Avoid idling the engine for long periods.
- Regularly check for oil leaks.
- To ensure long clutch life, carefully run in the clutch plates. To do this, operate the clutch frequently but gradually during the first 15 hours' service.

The above precautions also apply if the engine has been overhauled or major components replaced.

After the first 50 hours

- Change the engine oil and the engine oil filter cartridge. Then change the engine oil and the engine oil and diesel fuel filters at the intervals specified in the "Routine Maintenance Guide".
- Change the diesel fuel filters after the first 50 and 100 hours. After this, change the fuel filter at the intervals specified in the "Routine Maintenance Guide".
- Hydraulic and steering system: change the filter on the delivery and the filters on the intake. Subsequently change them after every 250 hours service.
- Check that all screws, nuts and bolts are tight.
- Check all fluid (oil) levels and top up with the correct type if necessary.
- Check the tension of the fan belt.
- Grease all points provided with grease nipples.
- Check tyre pressures.

PREPARING FOR LONG IDLE PERIODS

- Park the tractor in a dry, covered place.
- Clean the tractor.
- Drain the coolant from the radiator and engine.
- Grease all points provided with grease nipples.
- Clean all the diesel fuel filters.
- Drain the fuel tank and fill up with clean diesel fuel.
- Remove the injectors and squirt a small quantity of engine oil into the cylinders. Turn the engine over by hand and replace the injectors.
- Disconnect and remove the battery. Smear the terminals with clean Vaseline (not normal grease) and store in a dry place.
- Recharge the battery every three months while the tractor is idle.

Sealed units

Do not remove the seals from the following parts: injection pump and over-speed screw.

If you need to repair or adjust any of these units, contact your local dealer or authorized repair shop.

The warranty is automatically invalidated if these seals are tampered with.

Maintenance

Bonnet - Fig. 5-1

It is necessary to open the bonnet (1) to gain access to engine parts and to carry out inspection, lubrication and maintenance operations.

Pull (2) to open and tilt the bonnet.

Also the right and left sides (3) may be opened for certain operations. To this purpose, loosen the retainer (4) with a screwdriver or a coin. Pull the knob forward and remove it completely.

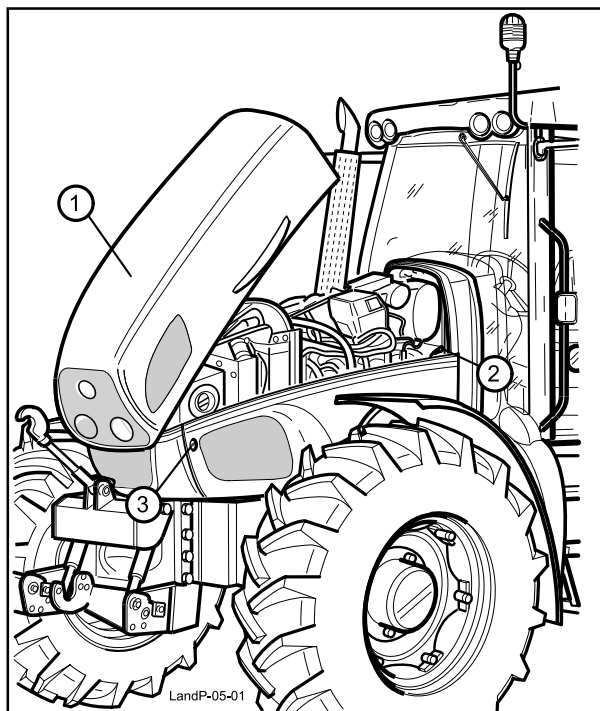


Fig. 5-1

Fuel tank filling - Fig. 5-2



WARNING: Do not smoke while filling the fuel tank. Keep clear of any ignition source during this operation.



Fig. 5-2

Engine oil

Use Supplement 3 detergent oil for the engine as specified in the Lubricants and Fuels Chart. Detergent oils contain additives to minimize corrosion, oil oxidation and sludge formation. Detergent oils also help disperse the carbon compound formed during combustion. In view of its wear-proofing properties during the running-in period, there will be a slight delay in bedding the piston rings. Oil consumption will consequently be slightly higher. This will, however, return to normal once the rings have finally bedded. Always change the oil at the specified intervals. Oil gradually loses its lubricant properties as combustion residues form and the oil's molecular chains break down.

Check the level of the engine oil every day or after every 10 hours service (Variable maintenance) (Fig. 5-3).

Check the oil level with the dipstick (1).

To avoid unnecessary oil consumption:

- Never add oil beyond the "maximum" mark.
- Never add oil before the level has dropped to the "minimum" mark.

If necessary, top up the level through the filler (2) with new oil of the type indicated in the "FUEL AND LUBRICANT CHART".

Change the engine oil after the first 50 hours service and then after every 500 hours.

Change the oil when the engine is hot. Remove the drain plug (4 - Fig. 5-4) with the tractor parked on level ground.

Replace and tighten the drain plug (tightening torque 3.5 daNm) (26 lbf ft).

Add new oil of the type recommended up to the MAX mark on the dipstick.

Caution: Allow the oil to settle in the sump before checking its level.

500 hours is the longest permissible oil change interval.

Under harsh conditions, change the engine oil more frequently, e.g. every 250 hours.

Engine oil filter

Change the engine oil filter for the first time after 50 hours service and then after every 250 hours.

Proceed in the following way to change the filter:

- 1 - Unscrew the old filters (3 - Fig. 5-3) from their supports.
- 2 - Smear clean oil on the seal of the new oil filter and make sure it fits into its housing on the filter head.
- 3 - Screw the new filter into its housing by hand and then hand-tighten one extra half turn. Do not overtighten.

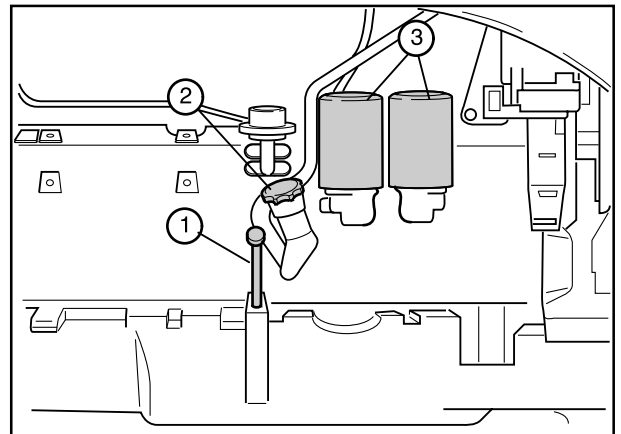


Fig. 5-3

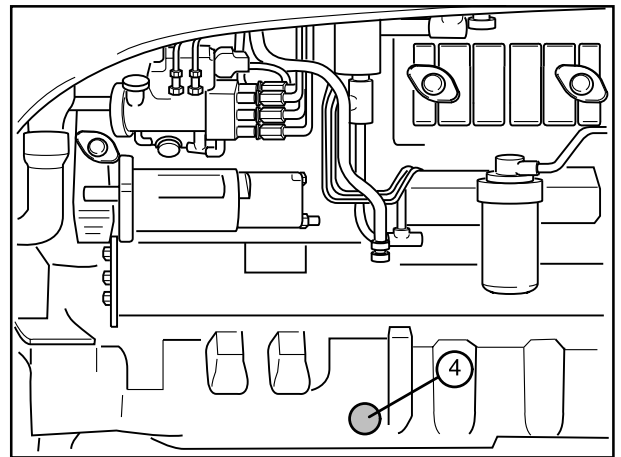


Fig. 5-4

WARNING: It is advisable to change the engine oil and engine oil filter at least once a year even if the established work hours have not been reached during that period.

WARNING: To ensure the engine is correctly lubricated, remember to only use genuine filter cartridges. Spurious spares can compromise the correct operation and life of the engine.

Maintenance

Fuel

Use only good quality diesel fuel. Poor quality fuel can reduce the efficiency of the injection system. Diesel fuel must be free from particles in suspension. If necessary, decant the fuel for two or three days before using it in the tractor.

Efficient fuel decanting can be achieved by using the simple but efficacious system illustrated in (Fig. 5-5). Never use fuel which has been left in an open can for any length of time and which could contain dirt or water.

Fill the tractor's fuel tank in the evening after finishing the day's work. This prevents condensation from forming inside the tank.

The fuel filter cap is fitted with a gauze filter which should be removed and cleaned at regular intervals.

CAUTION: *Never fill the fuel tank when the engine is on or over-heated.*

NOTE: *Never use galvanized containers to store fuel.*

Fuel filter

At suitable intervals, use the plug (2 - Fig. 5-6) to drain water from the fuel filter.

This operation must be carried out with the engine running.

During the running-in period, change the filters for the first two times at 50 and 100 hour intervals, respectively. Following this, change the fuel filter cartridge after every 500 hours service (1 - Fig. 5-6).

To change the fuel filter

Proceed in the following way (Fig. 5-7):

- 1 - Clean the outside of the filter.
- 2 - Open the drain cock (4 Fig.5-7) on the filter bottom and drain all fuel.

NOTE: If the filter has no drain cock, unscrew the cover (1) on the back of the filter head. Remove the nylon insert to lower the fuel level in the cartridge and to avoid spilling the fuel when removing the retainer ring (7).

- 3 - Hold the bottom of the filter in one hand and turn the retainer ring (2) to the left, as indicated by the arrow. Remove the ring
- 4 - Pull the cartridge (3) downwards to separate it from the filter head. Discard the cartridge.
- 5 - Check the filter head for cleanliness and check whether packings (5 and 6), one on the filter head and one on the cartridge, are in good conditions or need replacing. Bring the tab (8) to correspond with the groove in the filter head, then push the new cartridge inside to the stop.

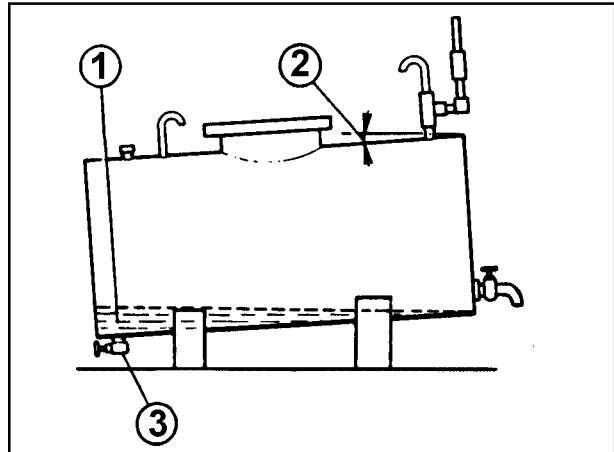


Fig. 5-5 - Setting up a tank for fuel decanting.

- 1 - Water.
- 2 - 25% slope.
- 3 - Sludge drain cock.

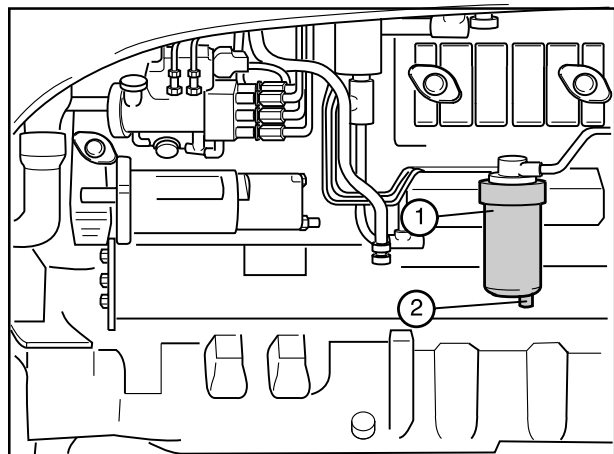


Fig. 5-6 - Fuel filters.

- 1 - Filter cartridge.
- 2 - Sludge drain plug.

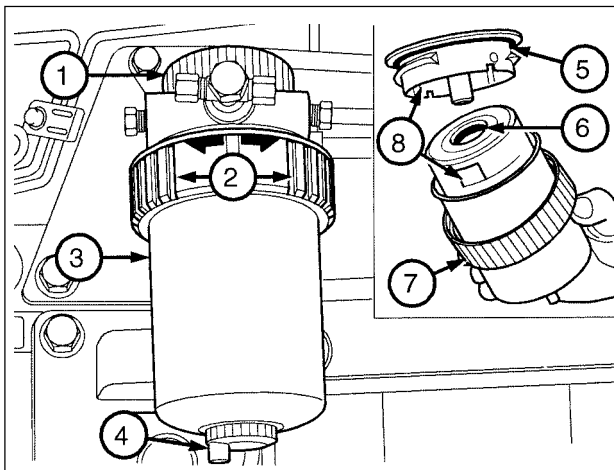


Fig. 5-7 - Demounting the fuel filter.

- 6 - Hold the cartridge in one hand, slip the retainer ring (7) onto it and turn to the right, as indicated by the arrow, to fasten the cartridge on the filter head.
- 7 - If the nylon insert had been removed to lower the fuel level, reinstall it and the cover.
- 8 - Bleed air from the fuel circuit if required.

Bleeding air from the fuel system

Air is normally expelled automatically from this type of system.

However, when the filters are removed, you should operate the fuel pump (1- Fig. 5-8) by hand to pump the fuel out, this to avoid operating the starter motor for an excessively long time.

Proceed in the following way to completely bleed the air from the system (Fig. 5-8).

- 1 - Make sure that the fuel tank contains a sufficient quantity of fuel.
- 2 - Slacken off the intake fitting at the top of the filter body (3 - Fig. 5-9) by a couple of turns. Operate the fuel pump lever (1) until bubble-free fuel flows out of the bleeder. Re-tighten the bleeder fitting.
- 3 - Slacken off one of the fittings that connect the injectors and allow the engine to turn over by means of the starter motor until the engine starts.

CAUTION: Do not operate the electric starter motor for more than 20 seconds at a time to avoid overheating the windings. If the engine fails to start, wait a while to let the starter motor cool down before trying again.

- 5 - Shut off the injector fitting when bubble-free fuel flows from the fitting itself.
- 6 - Check all the fuel lines and seals for leaks.

Empty the fuel tank every 1000 hours by means of the fitting in the left-hand front part.

Injectors

Every 1000 hours service have the injector settings checked by your dealer's authorized service center.

Valve clearance

Have the intake and exhaust valve clearance checked and adjusted by your dealer every 500 hours.

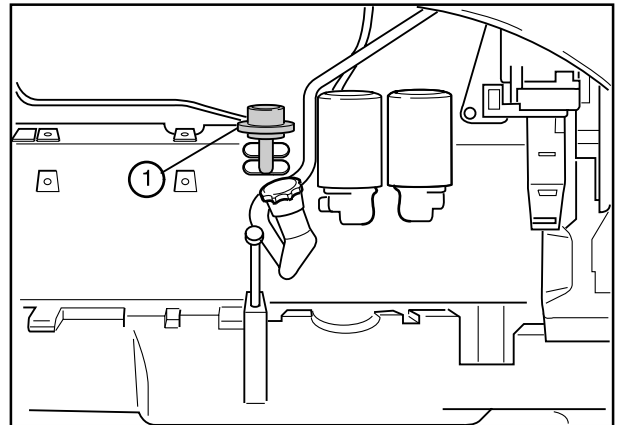


Fig. 5-8

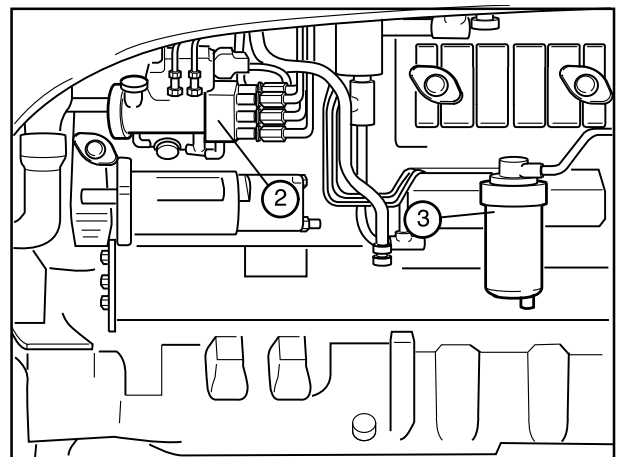


Fig. 5-9

Closed circuit breather unit (if mounted)

Have the closed circuit motor breather unit (if mounted) replaced by your dealer every 500 hours.

The whole unit should be replaced every 8000 hours or on occasion of an engine overhaul.

Maintenance

Dry air filter

The dry air filter should be cleaned daily or at suitable intervals, depending on work conditions, by opening the rubber drain valve (1 - Fig. 5-10) to remove dust or dirt deposits.

NOTE: *The air filter position varies according to the tractor model.*

Whenever the red filter blockage warning light on the instrument panel comes on, open the filter container cover (3 - Fig. 5-11), lift out the outer filter element (1 - Fig. 5-11) and clean it carefully with compressed air. The filter cartridge can be cleaned with compressed air.

Clean the filter cartridge (Fig. 5-12) by directing a jet of dry compressed air (maximum pressure 4 bar/60 psi) from the inside towards the outside.

Move the jet over the whole inside surface of the filter element, following the folds, until all the dust has been blown off.

Tap lightly on the cartridge to eliminate any residual dust.

Shine a light inside to check for holes, cracks or other damages.

Replace the outer filter element after it has been cleaned six times, or once a year, and whenever holes, cracks or other damages are found shining a light inside the element.

The inner backup filter element (2 - Fig. 5-11) should never be blown clean, but must be replaced after every 3 times that the outer element is cleaned.

Warning: *There is no point in cleaning the filter element before the red filter blockage warning light comes on. Unnecessary cleaning shortens the life of the element.*

- *Never loosen or remove air filter elements while the engine is running. Never run the engine without the air filter elements in place.*
- *Check the separator and the rubber seal. Change them if damaged.*
- *Use a clean damp rag to wipe the inside of the filter body clean before replacing the element.*
- *Make sure that the rubber air intake is in good condition and that the hose clamps are tight.*

NOTE: *To avoid downtimes or delays on work, keep a spare cartridge in stock for immediate replacement.*

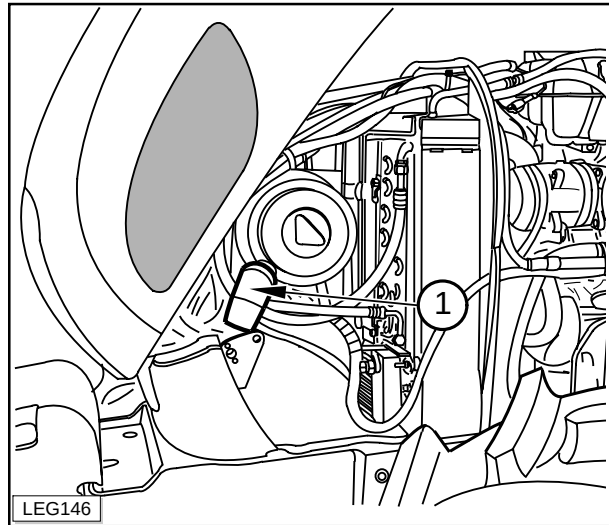


Fig.5-10

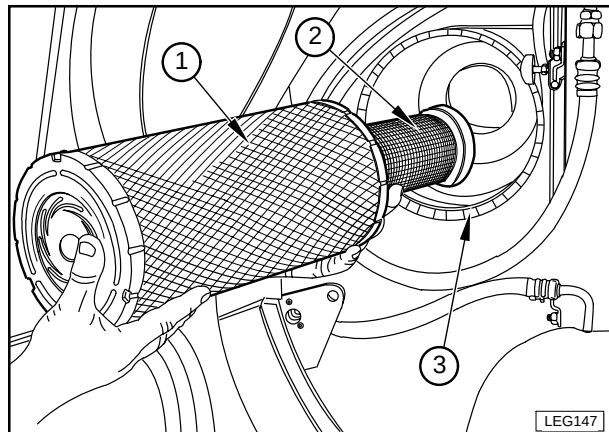


Fig.5-11

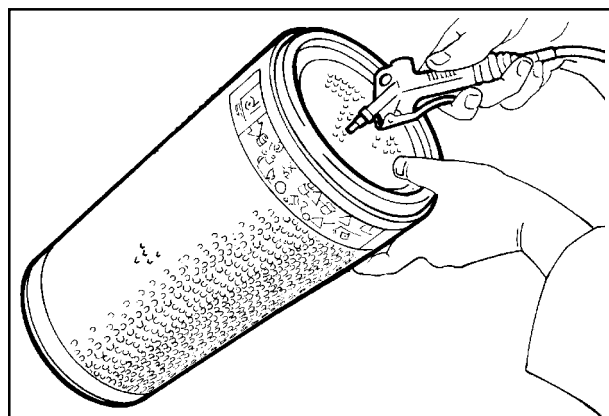


Fig.5-12

Engine cooling circuit

Check cooling fluid level daily and top up, if necessary, through the radiator cap (1 - Fig. 5-13).



WARNING: NEVER remove the radiator cap when the engine is hot. Unscrew the cap very slowly to release the pressure before taking it off completely.

Antifreeze fluid

Once a year or at the beginning of winter, check the density of the antifreeze; add antifreeze, if necessary, according to the following table:

Degrees C°	- 8°	- 15°	- 25°	- 35°
Percentage by volume of antifreeze	20	30	40	50

Filling the cooling circuit

1. Fill the circuit with coolant at the rate of approx. 10 litres/min.
2. Fit the filler cap back on (1 - Fig. 5-13).
3. Turn on the cab heating system.
4. Start and run the engine at 1200/1400 RPM for 3-4 minutes and then turn it off (this allows the air in the cab heating circuit to be vented off through the radiator).
5. Carefully remove the filler cap (1 - Fig. 5-13) and add fluid until the radiator is full, then fit the filler cap back on.

Drain and flush out the system every 1000 hours or once a year.

1. Completely drain all coolant from the radiator while the engine is not running but still warm, remove the filler cap (1 - Fig. 5-13), then open the radiator drain plug and the cylinder block drain plug .
2. Dissolve 250 g of sodium carbonate every 10 litres water, strain and pour the solution into the radiator when the engine is cold.
3. Work with the tractor for approximately 1 hour to warm up the engine and let the solution circulate. Then drain the solution through the above mentioned drain plugs.
4. Wait a few minutes for the engine to cool down, then let pure water circulate in the radiator, drain the water and check if it is clean.

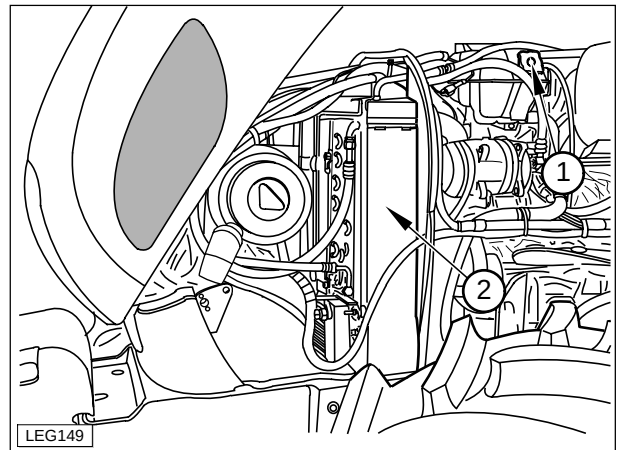


Fig.5-13

5. Close the drain plugs and fill up with coolant up to 20-25 mm under the edge of the filler cap.
6. Carefully open the filler cap and let the engine run at 1000 RPM for a few minutes. Check the coolant level again and fill up, if necessary. Close again with the filler cap.

Maintenance

Check the radiator fins every 100 hours (variable maintenance interval) and blow them clean with compressed air.

- Lift the bonnet and remove the left-hand side.
- Loosen the retainer (5 - Fig. 5-15) and pull out the transmission oil radiator (1 - Fig. 5-14)
- Blow the radiator fins clean with compressed air from the inside to the outside (max. allowed pressure 5 - 7 bar).

Cleaning the intercooler

At regular intervals, depending on the work conditions, clean the fins of the engine air intercooler of Legend 180 and the engine cooling radiator fins.

To gain access to the coolant radiator and to the intercooler, proceed as described below.



CAUTION: The following operations must be carried out in a clean closed room, to avoid dust or foreign matters entering the engine intake lines.

- 1 - Lift the bonnet and remove the left-hand side.
- 2 - Loosen the retainer (5 - Fig. 5-15).
- 3 - Remove the screws 3 and 4 (Fig. 5-16).
- 4 - Loosen the clamp 1 on the sleeve 2 of the engine air conduit (Fig. 5-16).
- 5 - Detach the sleeve 2 of the intercooler (3 - Fig. 5-16). Protect the holes (1) on the sleeve and (2) on the intercooler to avoid penetration of dust or foreign matters (Fig. 5-16).
- 6 - Proceed as described at points 4 and 5 for the right-hand sleeve.



CAUTION: Put a cap on all holes on intercooler and sleeves to avoid dust or foreign matters entering the engine intake lines.

- 7 - Carefully pull out the intercooler from the left-hand side and clean the fins of the intercooler and of the engine coolant radiator behind it. Blow a jet of compressed air from the inside to the outside (max. allowed pressure 5 - 7 bar).
- 8 - Repeat the operations 1 to 7 in reverse order. Remove all caps from the holes on the sleeves (1 - Fig. 5-16) and on the intercooler (2 - Fig. 5-16).

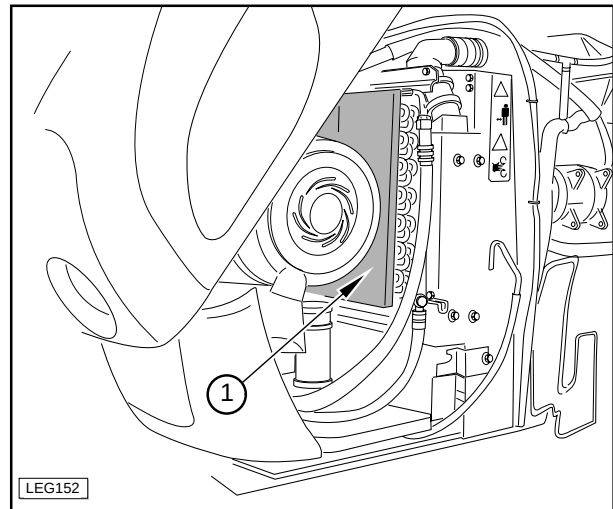


Fig.5-14

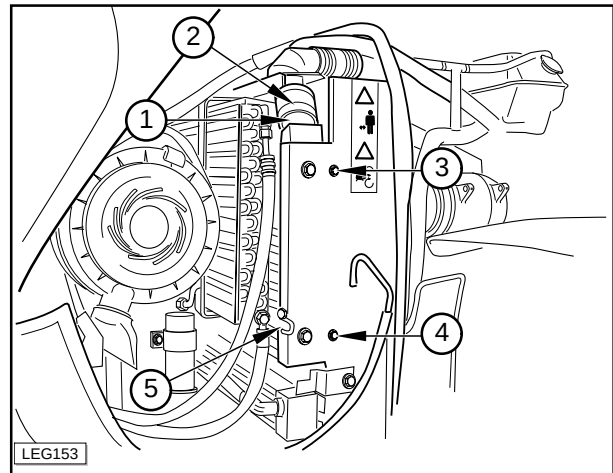


Fig.5-15

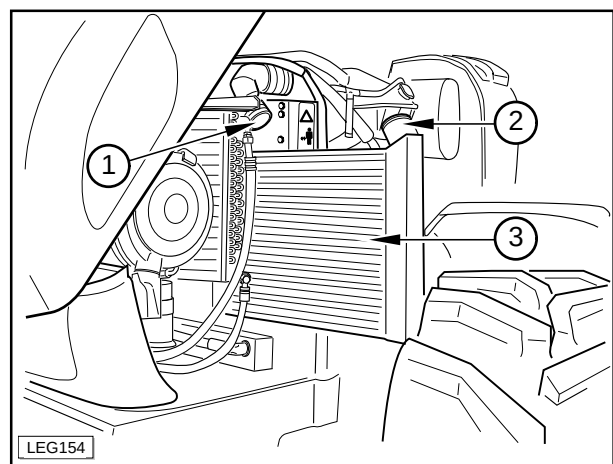


Fig.5-16

Transmission circuit, steering and hydraulic circuit oil levels

Regularly check the oil level in the transmission, steering and hydraulic circuits.

Loosen the yellow cap (1 - Fig. 5-17) on the rear transmission sump and remove the cap with the dipstick.

The oil level should be above half level between the minimum and maximum marks on the dipstick (Fig. 5-17) with the power lift arms fully raised: top up if necessary using oil of the specified type.

Ensure that the transmission oil is at the correct level since hydraulic actuators such as hydraulic cylinders, motors, etc., require a certain amount of oil.

To do this, it is sufficient to know the amount required to fill the implement. When the level is on the max. mark, only 7 liters may be used without compromising the correct operation of the tractor. With front loaders and other implements, the level must be on the third mark (+ 10 liters).

NOTE: Never let the oil level drop below the minimum mark. When external hydraulic circuits are used, the oil level must always be between the minimum and maximum marks.

NOTE: If you use the tractor on slopes, make sure the minimum oil level is respected even with the tractor on the steepest gradients it has to encounter.

NOTE: Make sure that the hydraulic services connected to the tractor use the same type of oil as the transmission. Mixing different oil types can lead to damage to the system.

NOTE: Use the oil prescribed in the Lubricants and Fuels chart.

Oil filters of the transmission and of the steering and power lift circuits

The operations for the transmission oil filters must be carried out not only at the prescribed intervals, but also whenever the indicator lights on the instrument panel come on.

Warning lights for transmission and hydraulic system oil filter blockage (Fig.5-19)

- 1 - Fixed light: Red warning light for blockage of the oil filter of transmission and hydraulic circuit. The filter is mounted on the intake part of the hydraulic pumps.
- 2 - Fixed light: Red warning light for low pressure in transmission hydraulic circuit. A warning buzzer will start operating when this light comes on during work. In this case, ask your Dealer's specialized workshop for help.

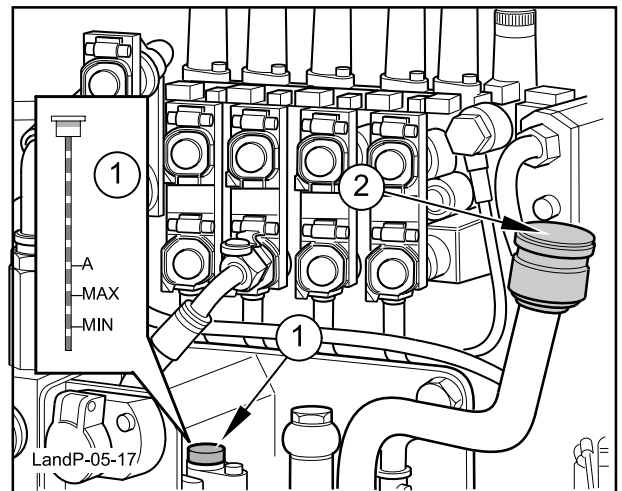


Fig. 5-17

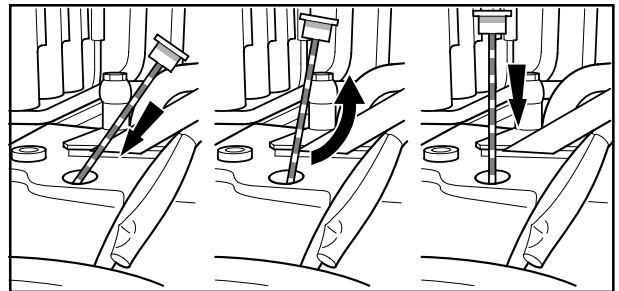


Fig.5-18

- 1 - The dipstick should be inserted slightly leaning forward.
- 2 - Pull the dipstick back while rotating it upward as indicated by the arrows, until it is vertical.
- 3 - Seat the dipstick pushing it downward. Tighten the cap.

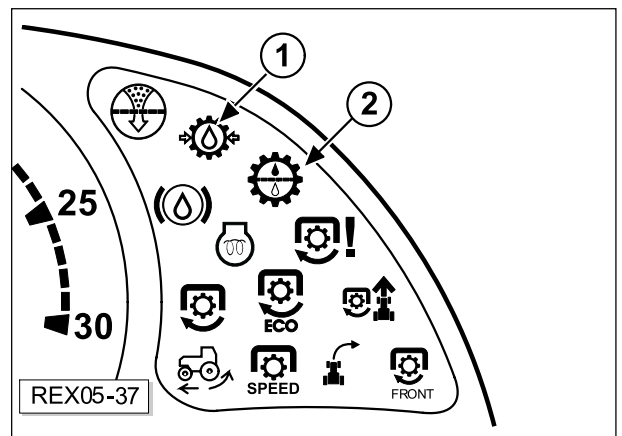


Fig.5-19

NOTE: When oil is cold and the red indicator is flashing, that does not necessarily mean the filter is really clogged. Before changing the filter, wait for the oil to cool down to ambient temperature. Only if the indicator still flashes, the filter should actually be changed.

Maintenance

Transmission, steering and power lift filters

The filters of the transmission oil and the power lift circuit are mounted on the intake (1 - Fig. 5-20) of the hydraulic pumps and on the delivery (Fig. 5-21) of the steering circuit. They are equipped with sensors which warn the operator when the filter/s is/are clogged and need to be changed by means of indicator lights on the dashboard (1 and 2 - Fig. 5-19): check to make sure which filter needs changing.

The filter cartridges should, however, be changed after every 250 hours service.

Filters on the intake (1 - Fig. 5-19) of the hydraulic pumps

- a - Unscrew the cartridge (A) from the support.
- b - Oil the new retention rings with new clean oil and fit it on to the new cartridge.
- c - Screw the new cartridge on to the supports until the retention ring touches the top of the filter, then hand-tighten another half-turn (do not tighten too much).

WARNING: Remember to change the filter for the first time after 50 hours service and then every 250 hours (250, 500, 750 etc.), or whenever the blockage indicator light comes on.

Filter on the delivery (Fig. 5-21) of the steering circuit (and Top-Tronic, if fitted).

Change the filter on the delivery after the first 50 hours service and then after every 250 hours (250, 500, 750 etc.) or when the red filter blockage indicator light comes on (2 - Fig. 5-19).

Change the element of the filter on the delivery on the left-hand side of the tractor:

- a - Unscrew the holder (1), remove and discard the filter element (3).
- b - Fit the new filter element (3) into the cover of the filter (2).

To prevent the filter element from being dirtied (with mud, etc.) only completely remove the plastic protection after fitting.

- c - Mount the holder (1) after having oiled its threaded part, the washer (4) and seal (5) with clean new oil. Take great care to fit the individual parts in the right directions.

Change the seal (5) and the washer (4) every 1000 hours service or whenever necessary.

- d - Fully screw on the holder (1) by hand.

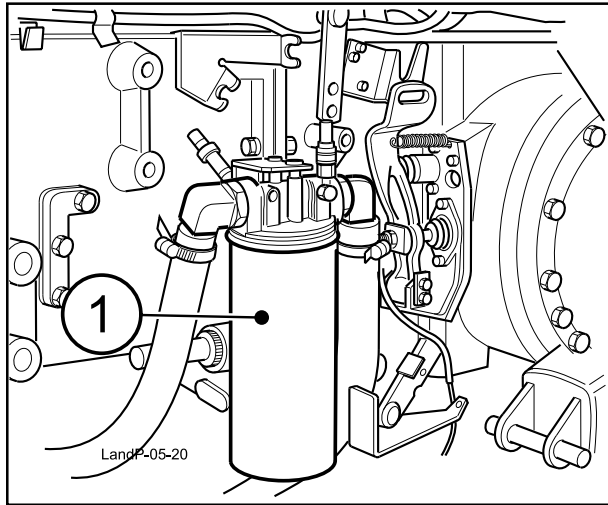


Fig.5-20

NOTE: After changing the oil and filter, run the engine for a while and make sure there are no leaks. Check the oil level again and top up if necessary.

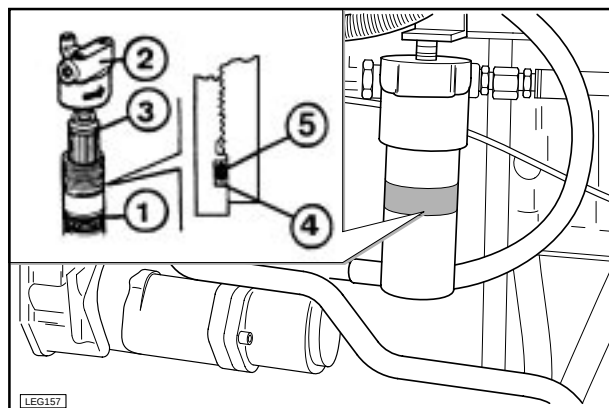


Fig.5-20

CAUTION: The paper filter should be replaced after the first 50 hours, then every 250 hours (i.e. at 250-500-750-1000 hours a.s.o.) or whenever the red light on the instrument panel is on to indicate that the filter is clogged (1 - Fig. 5-19).

Maintenance of Top-Tronic gearbox

Type of oil of Top-Tronic gearbox

Top-Tronic gearbox and the hydraulic system both of power steering and lift use the same oil type, see Lubricant and Fuel Chart.

NOTE: *Top-Tronic uses oil of a different type from the oil used in the Powersix gearbox. The two types must never be mixed together.*

For the general maintenance follow the previous instructions concerning oil and filters of transmission and hydraulic circuits:

- Check oil level on a daily or variable maintenance basis, depending on work conditions.
- Change the transmission oil for the first time after 500 hours, then every 1000 hours.
- Change filters on intake and main filter on delivery for the first time after 50 hours, then every 250 hours.

Change the oil in the transmission

Change the oil in the transmission (all models), steering and power lift circuits every 1000 hours (see Routine Maintenance Guide).

NOTE: *After changing the oil and filters, allow the engine to turn and make sure there are no leaks. Check the oil level again and top up if necessary.*

NOTE: *Make sure that the hydraulic equipment connected to the hydraulic system contain the same type of oil. Never use oil of different types, as this could damage the hydraulic system.*

Cleaning the transmission oil radiator

Clean the transmission oil radiator fins if required (1 - Fig. 5-22) by the work conditions.

- Lift the bonnet and remove the left-hand side.
- Loosen the retainer (2) and pull out the radiator. Blow the radiator fins clean with compressed air at max. 7 bar.

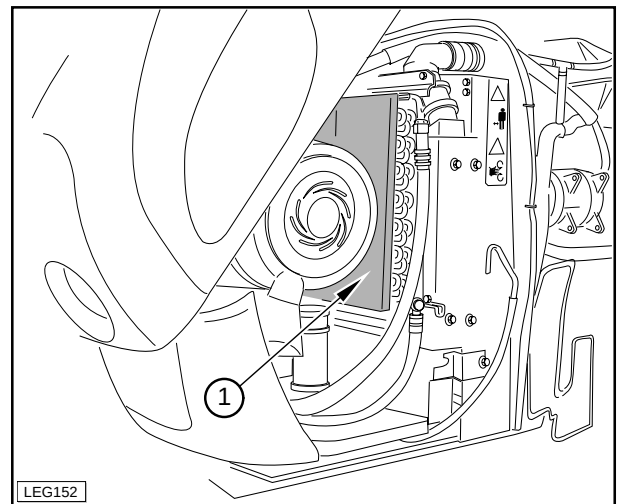


Fig.5-22

Maintenance

Clutch for Speedsix and Powersix gearboxes

The clutch is hydraulically controlled and needs no adjustment. Consult your dealer if necessary.

Clutch fluid reservoir

At suitable intervals, check the level of the fluid in the clutch reservoir. Make sure that the reservoir (1 - Fig. 5-23) is always full. Always use mineral based oil (the same as the brake circuit) as indicated in the Lubricant and Fuel Chart.

Bleeding air from the clutch circuit

It becomes necessary to bleed the circuit when air enters owing to lack of oil in the relative reservoir or when the clutch system is serviced.

This operation should be carried out by specialized personnel. If, however, you decide to do it yourself, proceed in the following way.

- 1 - Make sure that the reservoir (1 - Fig. 5-23) is full.
- 2 - Thoroughly clean the area around the bleed screw.
- 3 - Fully depress the clutch pedal.
Meanwhile, unscrew the bleed screw (2 - Fig. 5-24) on the clutch cylinder (1 - Fig. 5-24) a half-turn and allow any air and oil to flow out. Re-tighten the bleed screw and release the pedal.
- 4 - Repeat this operation until bubble-free oil flows from the bleed screw.
- 5 - Make sure that the clutch pedal travel is firm and not spongy.
- 6 - On completion of bleeding, top up the fluid level in the reservoir (1 - Fig. 5-23).

NOTE: *Never reuse previously bled oil without having first filtered it.*

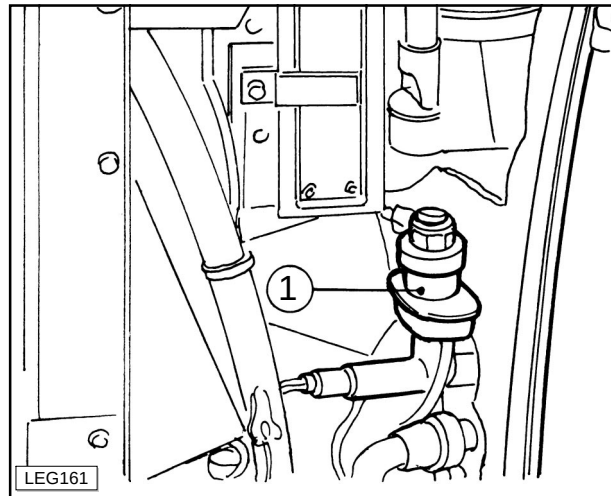


Fig.5-23

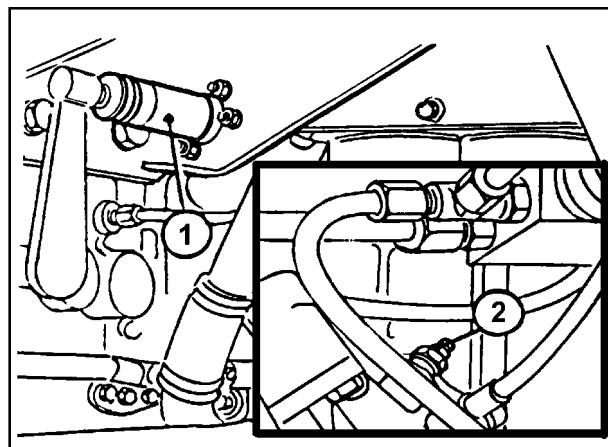


Fig.5-24

Brakes

Brake fluid reservoir

At suitable intervals, check the level of the fluid in the brake reservoir. The reservoir (1 - Fig. 5-25) must always be kept full. Top up only with the correct brake fluid, as indicated in the Lubricants and Fuels chart.



WARNING: When changing and topping up the fluid in the clutch, if applicable, (1 - Fig. 5-23) and brake (1 - Fig. 5-25) reservoirs, be absolutely sure to use the correct type of fluid as different varieties have totally different properties. These machines use an LHM mineral-based fluid. Never mix or exchange different types of fluids. See the Lubricant and Fuel Chart for fluid types.



WARNING: The oil in the brake circuits has been studied to operate at a temperature of 100°C but only if not polluted by other substances, e.g. water in considerable amount will turn into vapour and prevent the braking system from operating in the correct way. Take the necessary precautions to prevent water from entering the system: protect the front axle and the components in the braking system when the tractor is washed; store oil in sheltered places where water cannot infiltrate. If you think that there is water in the braking system you must contact your dealer's specialized personnel and have it removed. In this case, the rear brake cylinders will have to be demounted and emptied and particularly the brake housing of the front axle which, being the lowest part of the system, is the one most exposed to this type of fault.

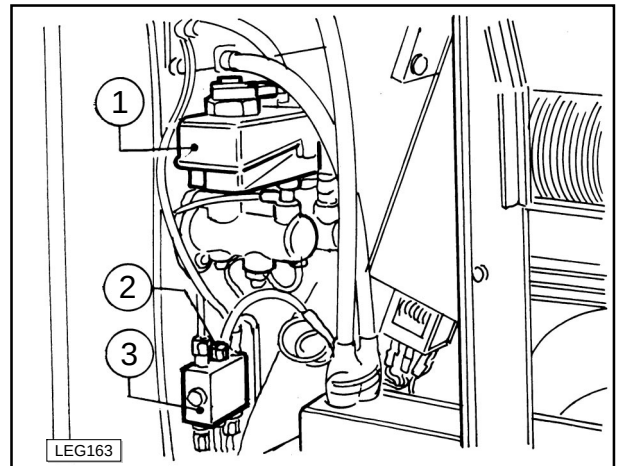


Fig.5-25

NOTE: To access the brake fluid reservoir(1) remove the pressure-mounted left-hand panel (not shown).

Maintenance

Bleeding air from the rear brake circuit

It becomes necessary to bleed the circuit when air enters owing to lack of oil in the relative reservoir or when the braking system is serviced. This operation should be carried out by specialized personnel. If, however, you decide to do it yourself, proceed in the following way.

- 1 - Check that the brake fluid reservoir (1 - Fig. 5-25) is full.
- 2 - Thoroughly clean the area around the bleed screws.
- 3 - Press down on the left-hand brake pedal. Meanwhile, unscrew the bleeder (4 - Fig. 5-26) by half a turn to expel all frothy fluid from the bleeder. Re-tighten the bleeder first and then release the pedal.
- 4 - Repeat this operation until the fluid that comes out is free from air.
- 5 - Make sure that the brake pedal travel is correct and that the action is firm and not spongy.
- 6 - Repeat the above operations for the right-hand brake circuit.
- 7 - On completion of bleeding, top up the brake fluid reservoir (1 - Fig. 5-25).

NOTE: Never reuse previously bled oil without first filtering it.

Bleeding air from the front brake circuit

After having carefully carried out operations 1 to 7 to bleed the rear brakes, proceed in the following way:

- 1 - Depress both brake pedals at the same time. Use the special coupling lock to keep the pedals together. Unscrew the bleed screw (2 - Fig. 5-26) on the on-off valve (3 - Fig. 5-25) until bubble-free oil flows out. Re-tighten the screw and release the pedals.
- 2 - Depress both pedals at the same time and slacken off the two bleed screws (1 - Fig. 5-27) at the rear of the central part of the front axle. Repeat this operation until bubble-free oil flows out.

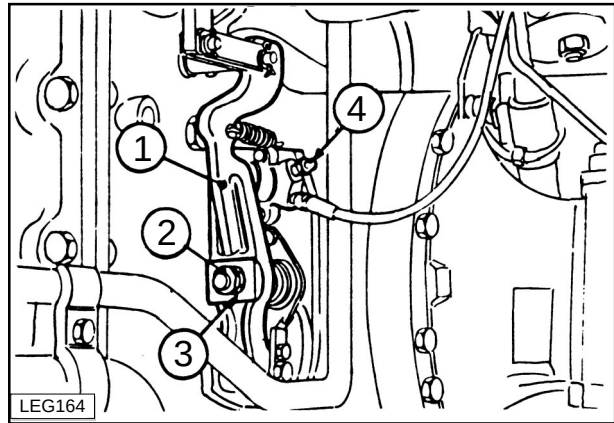


Fig. 5-26

Adjusting the free travel of the brake pedals.

- 1 - Brake lever.
- 2 - Check nut.
- 3 - Adjuster nut.
- 4 - Bleeder screw.

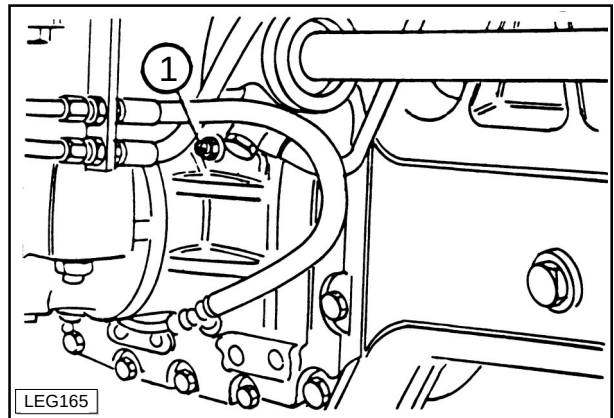


Fig.5-27

NOTE: If the tractor is equipped with a valve for hydraulic trailer braking, it will also be necessary to bleed off any air in the piloting tube of this valve. A screw on the body of the valve allows this operation to be easily carried out.

- 3 - Check free pedal travel and that the front brakes act at the same time. Do this by testing the action on the road.
- 4 - After this, top up the level in the reservoir with oil of the prescribed type.



WARNING: Always keep the brake pedals coupled for on-road driving in order to ensure simultaneous braking on both sides. Never use the brakes independently on public roads. When working on slopes, avoid using the brakes as much as possible. Instead, select a lower gear and use engine braking.

Adjusting the brakes**Rear brakes**

Check the efficiency of the braking system regularly.

The braking system must be adjusted when the free travel of the pedals (A - Fig. 5-28) becomes excessive and the pedals are near to end of travel.

Proceed in the following way to restore free pedal travel to its normal value of about 3.5 cm (1.4 in.) (dimension A):

- 1 - First make sure that there is no air in the hydraulic brake circuit. Bleed if necessary. (The presence of air in the circuit is normally denoted by a spongy braking action).
- 2 - Jack up the rear wheels of the tractor.
- 3 - Make sure that the parking brake is off.
- 4 - Free the brake pedals by raising the lock.
- 5 - Unscrew the check nut (1 - Fig. 5-30). Slowly tighten the adjuster nut (2 - Fig. 5-30) until you can no longer turn the wheel by hand.
- 6 - Make a reference mark on the adjuster nut and on the support, then slacken off the adjuster nut by 1 and 4/6ths of a turn (Fig. 5-29), i.e. until the wheel can be freely turned. Now lock the adjuster with the relative check nut (1 - Fig. 5-30).
- 7 - Check that the brake pedal has a free travel of 3.5 cm (1.4 in.) and repeat the adjustment if necessary.
- 8 - Repeat the procedure for the other side. Finally, check that the free travel is the same for both pedals and that the brakes engage simultaneously on both sides.
- 9 - Check that the parking brake lever has not been affected and adjust if necessary.

Front brakes

No periodic adjustment is required as the front brakes are self-regulating.

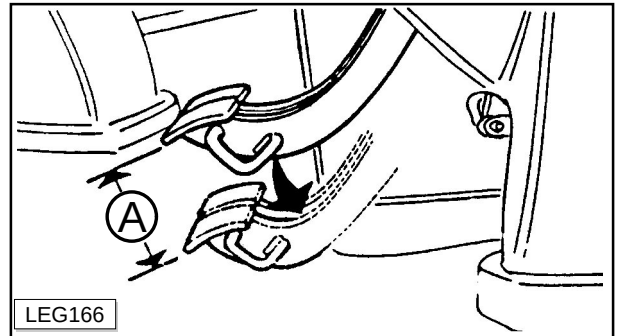


Fig.5-28

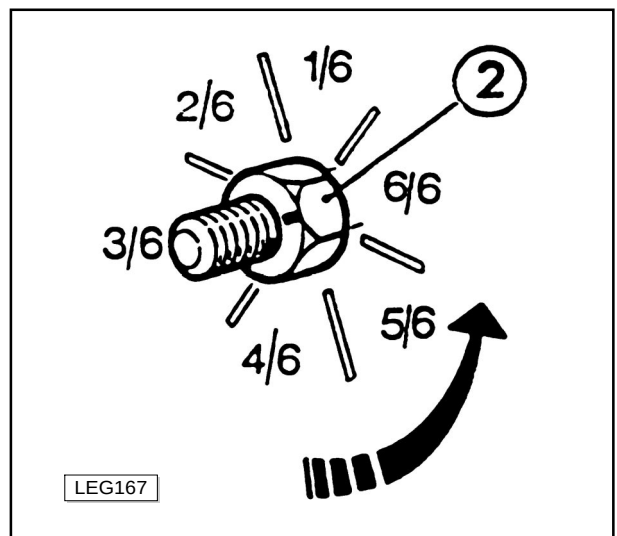


Fig.5-29

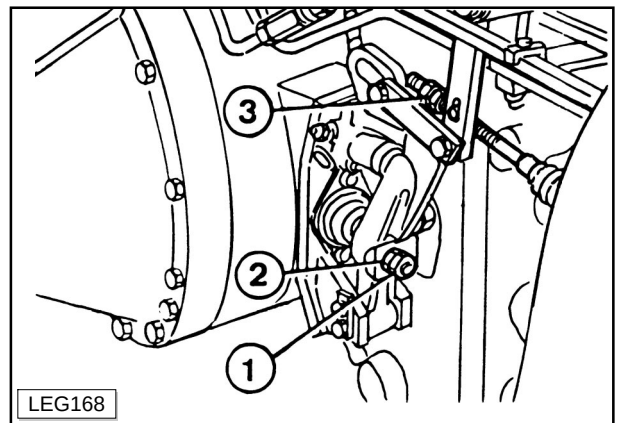


Fig.5-30

Maintenance

Parking brake

The parking brake hand lever is directly linked to the brake pedals.

Make sure that free travel is identical for both pedals, since free travel of the pedals determines the free travel of the parking brake and left/right distribution of the braking action when the brakes are locked.

Once you have adjusted the brake pedals, adjust the free travel of the parking brake by means of the adjuster nut (3 - Fig. 5-30) on the brake lever, so that the parking brake engages after 2 clicks of the ratchet mechanism.

Hydraulic trailer brakes

To brake the trailer along with the tractor, the flexible tube of the trailer brakes must be connected to the fitting at the rear of the tractor (1 - Fig. 5-31b). Always make sure that the two parts are clean before you connect them, to ensure that the various components operate in a perfect way.

 **WARNING.** *Trailer brake approved for ITALY. When the tractor is operating, it is absolutely essential to engage the parking brake when either connecting or detaching the tube that links the tube of the trailer braking system to the quick coupling (2 - Fig. 5-31b).*

NOTE: *Air may enter the hydraulic trailer brake circuit during normal servicing operations such as oil changes, cleaning of oil ducts. Air in the circuit leads to vibrations on the pedal when the brakes are used. Air can be easily bled from the circuit by pulling the parking brake lever and depressing the brake pedal several times.*

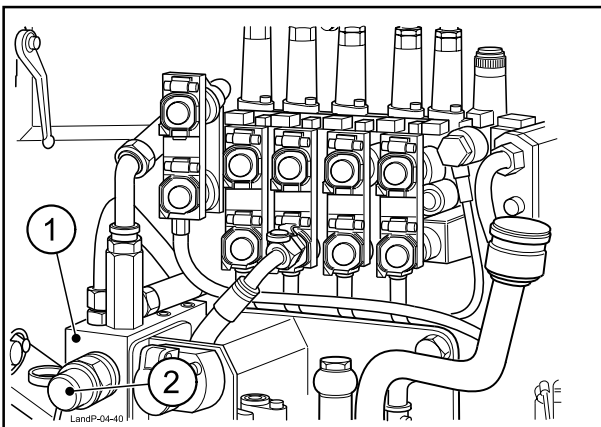


Fig.5-31b

ALTERNATOR AND FAN BELT

Replacing the belt

The fan belt must be immediately changed if it is worn or torn.

Check the condition of the belt regularly.

Contact your dealer's authorized repair shop to have it replaced.

Adjusting the belt tension

Regularly check the tension of the fan - alternator belt.

Belt tension is correct when it gives 1-1.5 cm (3/8 - 1/2") when pressed with the thumb (Fig. 5-31).

If the belt is slacker, turn the alternator outwards after having loosened its fixing screws (1).

NOTE: *Remember that the belts must never be too taut as this would lead to rapid wear and damage to the alternator and fan supports.*

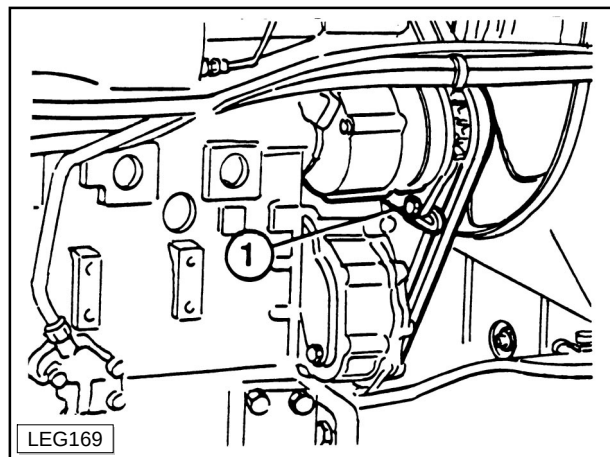


Fig.5-31

AIR CONDITIONED CAB

The cab can be fitted with an air conditioning system on request.

Besides being able to provide an optimum temperature in the cab, this system also lowers the degree of humidity in the air.

SAFETY NOTES

The air conditioner is a safe system that is able to ensure lasting and risk-free use. However, it is important to comply with certain simple precautions (listed below) in order to prevent possible accidents.

- Never work on the conditioning system yourselves. Always contact the specialized technicians of the Assistance Service (Fig.5-32).
- Keep naked flames well away from the air conditioning system (Fig.5-33) as leaking coolant could give rise to a deadly gas: phosgene.
- The mixture of oil and coolant in the air conditioning system is under pressure. Never ever loosen any unions or tamper with the pipes. For the same reason, you must never unscrew the compressor's oil level check plug.
- Coolant can freeze the skin and particularly the eyes. Proceed in the following way if accidents occur:
 - if coolant has splashed into the eyes, wash them out immediately with a few drops of mineral oil, then continue to wash them with a solution of boric acid and water (one teaspoon of acid in 1/4 of a cup of water) and immediately seek medical help;
 - areas frozen by coolant fluid can be treated by progressively warming the injured zone with cold water and then applying a greasy cream. However, always seek medical help if such accidents occur.
- Keep the air conditioning system well away from heat sources as explosions could occur (Fig.5-34).



Fig. 5-32



Fig. 5-33



Fig. 5-34

Maintenance

PERIODICAL INSPECTIONS

At least once every three months:

- remove any foreign bodies from between the evaporator and condenser fins;
- check the tension of the compressor belt;
- allow the engine to run at a rate of 1500 rpm. In the meantime keep the dehydrator filter under observation: the glass should be clear, without air bubbles or white liquid.
- check the conditions of the pipes, unions and supporting brackets;
- make sure that the drain pipes are efficient and remove the condensation from the evaporator;
- make sure that the screws and fixing nuts of the pulleys and compressor are well tightened.

MAINTENANCE

If the conditioning system remains unused for a long period of time, it must be turned on for a few minutes each month to allow the oil to circulate around the circuit and to keep the seals in an efficient condition. Only operate the conditioner when the engine is hot and the temperature in the cab has reached 20°C.

YEARLY MAINTENANCE

Have your Dealer's specialized personnel carry out the following operations at the beginning of the season:

- check the level of the oil in the compressor and top it up if necessary;
- make sure that the system is tight by means of a leak tester and top up the HFC 134a gas if necessary, or
- replace the dehydrator filter only if strictly necessary;
- carry out a functional test on the system.

GENERAL CAB MAINTENANCE (ALL VERSIONS)

After servicing the external parts of the cab, proceed with the following inspections:

1. Periodically check to make sure that no water has collected in the zones covered with mats or upholstery.
2. Protect the hinges and locks of the doors, sun roof and openable windows with water-repellent lubricating products.
3. Use special cleaning products to clean the windows, or sulphuric ether, if necessary.
4. Detach the windscreen wiper and sprinkle talcum on the rubber wiper.
5. Leave the doors or sun-roof partially open.

CAB UPHOLSTERY

CAUTION: Use water and a neutral detergent to clean the polyurethane cab upholstery or the specific products available on the market for cleaning car interiors. Any commercial product for car upholstery cleaning may be used. Do NOT use any products deriving from hydrocarbons, ketonic or aromatic solvents, or cleaning spirits of any kind.

SPECIFICATIONS

Coolant fluid R134 A

Air conditioning system reloading

- Quantity of gas to be loaded: 1750 g (+/- 50 g)
- Keep the gas unit steady when filling the circuit, in order to allow for a precise reading of the gas weight.
- Operating pressure (20 bar).

IMPORTANT: This tractor uses a R134A coolant that does not damage the ozone layer. Do not introduce any coolant different from the prescribed one into the air conditioning system. This could jeopardize the cooling power and irretrievably damage the system.

Check the tension of the compressor belt as indicated in Operation 12 in the Periodical Maintenance chapter.



DANGER: Wear safety garments and goggles in case of leaks. Coolant can injury the eyes. The coolant produces a toxic gas if it contacts a flame.

Cab air filters Fig.5-35



WARNING: Remember that the cab filters are not suitable for chemicals in general.

Absolute protection against these products can therefore only be achieved by taking the precautional measures required by the degree of harmfulness of the actual products used.

It is essential to strictly conform to this latter precaution for all types of filter whose use requires compliance with the envisaged operation and maintenance instructions.

However, even use of filters to protect against chemicals in general does not exempt operators from taking all the personal precautions recommended for use of such products.

These specific filters must only be mounted when the actual chemicals are being used and must then be replaced with the normal paper filters supplied with the machine at the end of each treatment.

Do not use them during the other processes since the dust would quickly clog them.

Carefully comply with the operating instructions on the filter packages or labels.

Contact your Dealer if specific filters against chemicals must be used.

CAUTION: Take the filters off before washing the cab. If the cab is washed and the special filter has not been demounted, take care to prevent the jet of water from splashing on to the protective grille (Fig. 5-36) otherwise your cab's special filter will be irreparably damaged.

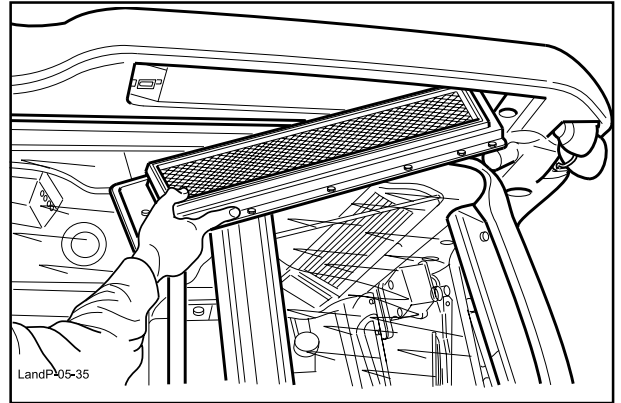


Fig.5-35

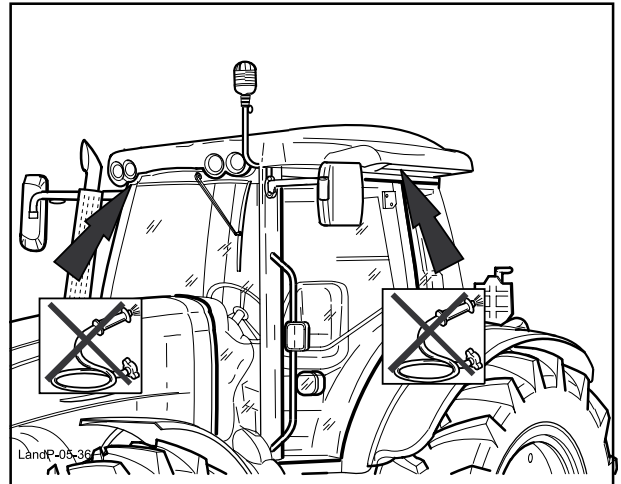


Fig.5-36

Maintenance

CAB - MAINTENANCE ON REQUEST

Operation 1

Cab air filters Fig.5-37

2 filters mounted on the sides of the cab roof

- 1 - Unscrew and remove the fixing knobs (2) of the cover (1).
 - 2 - Remove the cover.
 - 3 - Unscrew the two knobs fixing the filter.
 - 4 - Remove the filter (1) and clean as follows:
 - delicately tap it on a flat surface with the external side pointing downwards;
- or:
- use a jet of compressed air at a pressure of less than 6.9 bar (7 kg/cm²);

Clean the filter housing with a cloth.

When the filter is remounted, the cartridge (1) must be oriented as indicated on the cartridge itself.

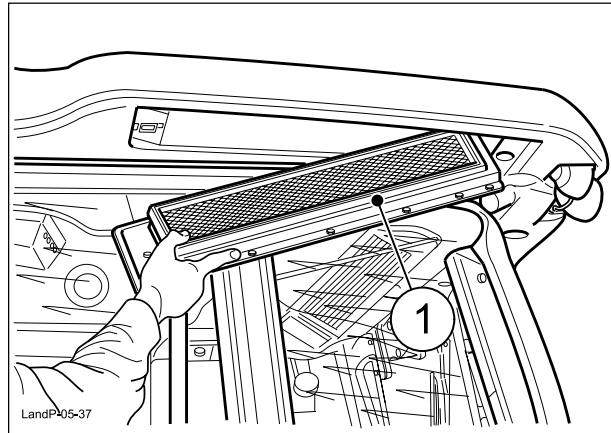


Fig.5-37

Operation 2

Compressor drive belt

Regularly check the tension of the A/C compressor drive belt and adjust in the following way if necessary (Fig. 5-38).

- 1 - Loosen the fixing nuts (1).
- 2 - Loosen the nut of the slotted support (2), position the compressor (3) so that the belt (4) gives 15 mm in the center of its longest side.
- 3 - Tighten all the nuts.
- 4 - Also make sure that the alternator-fan belt is correctly adjusted.

NOTE: The belt must be replaced if it is cracked or needs adjusting too frequently.

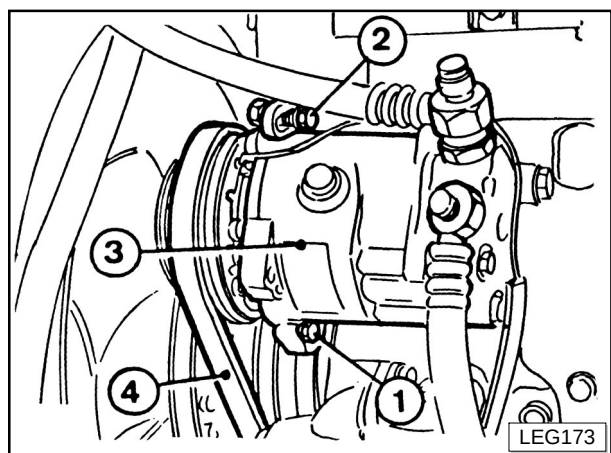


Fig.5-38

Operation 3

Cleaning the air conditioning condenser

Fig. 5-39

Regularly check the system to keep it in a good condition and use compressed air to remove any dust and dirt from and around the condenser fins.

To access the condenser (1 - Fig. 5-39), remove the two side panels from the engine, then blow compressed air at a max. pressure of 7 bar (98 psi) in the opposite direction to that of the normal air flow.

WARNING: *Never disconnect any pipes or hoses in the air conditioning system to reach the condenser.*

WARNING: *If the tractor is to remain unused for a long period of time, or if the system is not used, remember to allow the air conditioner to operate for about 15 minutes each week. This precautionary measure prevents gas from leaking from the compressor.*

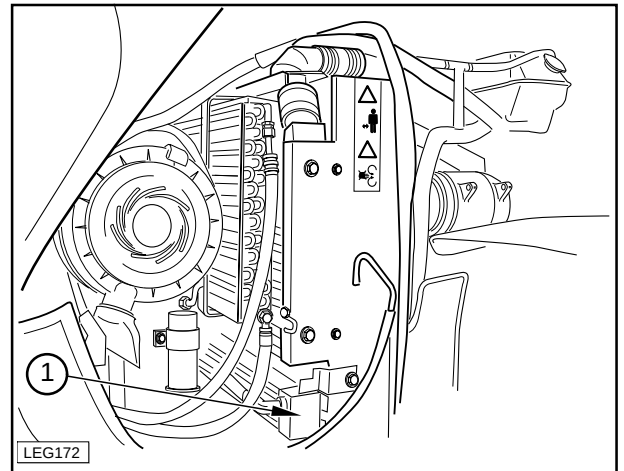


Fig. 5-39

Operation 4

Window washer liquid reservoir- Fig.5-39b

Check the window washer liquid level (1) at regular intervals. Fill it up if required.

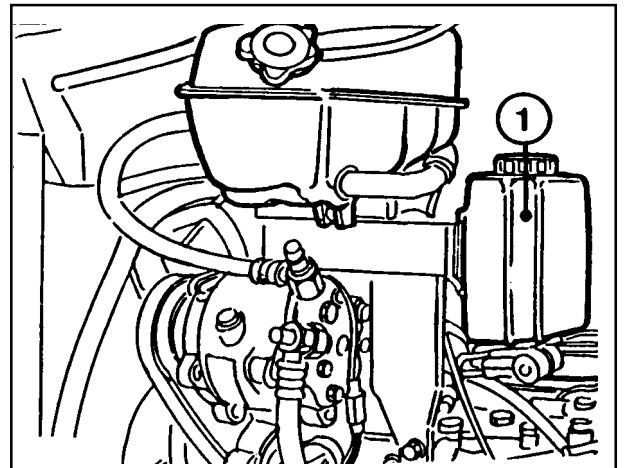


Fig. 5-39b

Maintenance

CAB AFTER EVERY 1000 HOURS SERVICE OR ONCE A YEAR

Operation 5

Cab air filters Fig.5-40

Remove the cover (Operation 1) and replace the filter cartridge inside (1).

NOTE: *The filters must be replaced every time the air conditioning system is serviced. In such occasions, check the oil level in the compressor.*

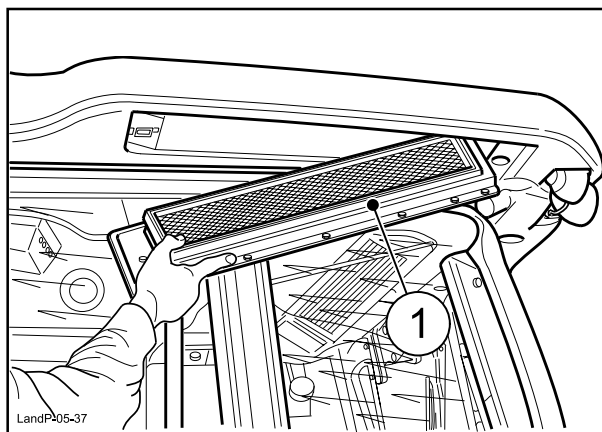


Fig.5-49

Operation 6

Compressor Fig.5-41

Have the air conditioning system operation checked. Also check the lubricating oil level in the compressor (1).

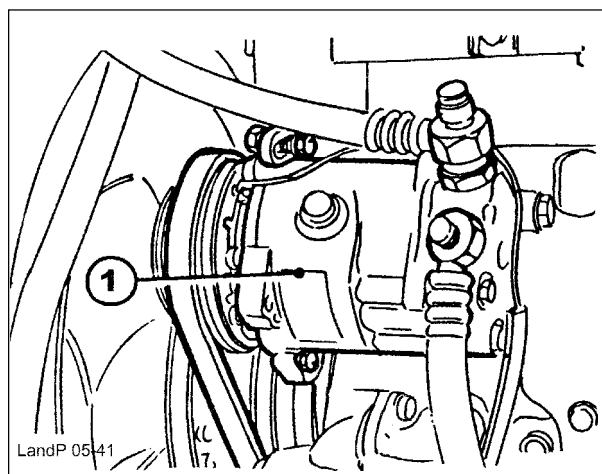


Fig.5-41

ROUTINE MAINTENANCE GUIDE

The routine maintenance guide has been prepared to make tractor servicing easier. The maintenance operations have been grouped according to the intervals at which they must be carried out, allowing the operator to draw up his own maintenance schedule. The individual operations are not given in

detail: consult the «Maintenance» chapter for greater information.



IMPORTANT: Operations marked with a circle must only be carried out by authorized repair shops.

IMPORTANT PRECAUTIONS

DRY AIR FILTER - The filtering cartridge must be cleaned whenever the red filter blockage indicator becomes visible. It can either be cleaned by blowing with compressed air or washing with water and non-foaming detergent, depending on how dirty it is (see instructions in the "Maintenance" chapter).

Replace the outer filter element after it has been cleaned six times, or once a year, or whenever holes become visible when a lamp is held inside.

The inner backup filter element should never be blown clean or washed, but must be replaced every 3 times the outer element is cleaned.

There is no point in cleaning the filter element before the red filter blockage indicator has appeared. Unnecessary cleaning may damage the cartridge.

ENGINE OIL FILTER - Use only original spare filter cartridges. Non-original filters can damage the engine and shorten its working life.

REGULATING THE INJECTION PUMP - This is carried out for normal engine operation and the maximum adjuster screw is sealed during the test phase. All warranty rights will immediately become void if the seal is tampered with.

FUEL FILTERS - The filter cartridges must never be washed. They must be replaced only.

TRANSMISSION OIL - It is advisable to change the transmission oil for the first time after the first 500 hours service. After this, change the oil after every 1000 hours service.

BATTERY - Check the level of the electrolyte in the battery every 3 or 5 months depending on the ambient temperature. This must be done with the engine switched off, the battery cold and with the tractor parked on flat, level ground. Use only distilled water to top up the battery.

TYRES - Check tyre pressure at regular intervals. Remember that the values given in the Technical Specifications chapter of the Operation and Maintenance Manual are only indicative and must be adjusted to suit tyre compound (which varies from one manufacturer to another), ballasting and operating conditions, etc.

GREASING - Before lubricating parts equipped with grease nipples, thoroughly clean the surfaces of these latter and make sure that the retention ball is free. After lubrication, remove all traces of grease to prevent soil or dust from sticking to it.

RECOMMENDATIONS

Routine maintenance must be carried out with reference to the hours displayed on the tractor meter hour counter.

Whenever ambient temperatures drop below 0°C (32°F), and at least once a year before winter sets in, check the concentration of antifreeze in the cooling circuit. Restore the required percentage by volume up to 50% if protection is required down to -35°C (-31°F) (consult the instructions in the "Maintenance" chapter).

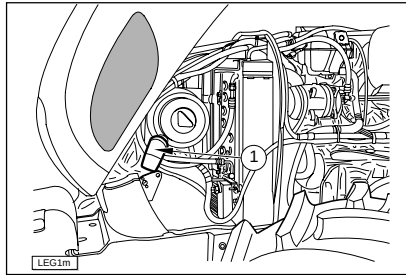
Maintenance

VARIABLE MAINTENANCE

Caution: Use your own discretion and experience when deciding the actual timing for variable interval service and maintenance operations. It is obviously better to carry out these operations too often than not often enough.

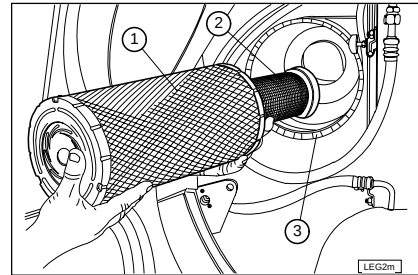
GREASING - Before lubricating parts equipped with grease nipples, thoroughly clean the surfaces of these latter and make sure that the retention ball is free. After lubricating, remove all traces of grease to prevent soil and dust from sticking.

BOLTS IN GENERAL - Make sure that all the external bolts on the tractor are well tightened, particularly the wheel nuts and bolts.



1 Air filter valve:

Check whether the discharge valve is clogged by pressing on the rubber end (1).



2 Air filter:

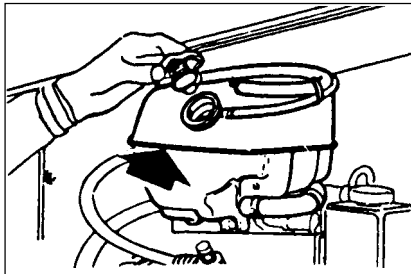
Whenever the red filter blockage indicator on the air pump under the dashboard comes on, open the filter body, remove the outer filter element (1) and clean it:

- with a dry air jet of less than 6 bar (87 lbf/sq.in) directed from the inside towards the outside of the filter,

or

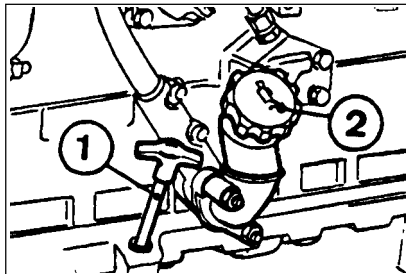
- with water and detergent. After this, rinse in clean water and dry with dry air at a temperature of not more than 50°C (112°F).

Never wash or blow clean the inner filter element (3). Thoroughly clean the body (1) and refit the filter. Consult the «Important Precautions» and the instructions in the «Operation and Maintenance» manual.



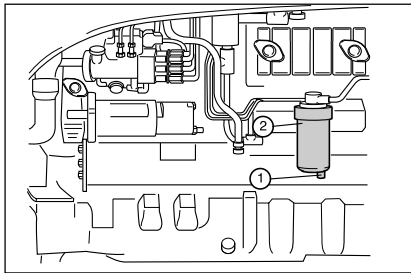
3 Radiator:

Make sure that the level of the coolant reaches the reference mark on the reservoir. Top up if necessary.



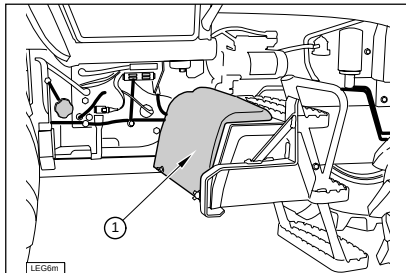
4 Engine oil:

Check the oil level using the dipstick (1) and top up if necessary with oil of the prescribed type through the fill plug (2).



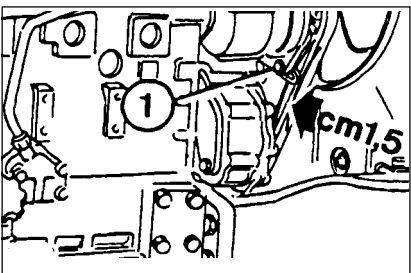
5 Fuel filter:

Loosen the drain plug (1) at the bottom of the filter bowl (2) (2 pcs) and drain out all sludge. This operation must be done with the engine running.



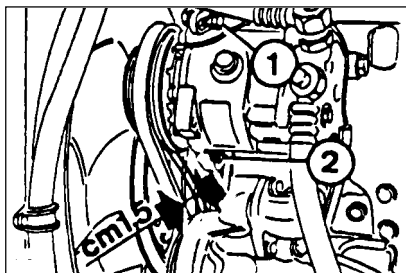
6 Battery:

Check the level of the electrolyte in each cell of the battery (1). See the «Important precautions» when topping up.



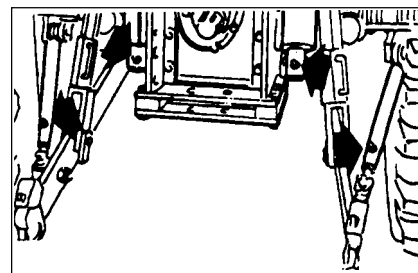
7 Alternator belt:

Check that give is approx. 1-1.5 cm (3/8-1/2"). Slacken screws (1) if adjustments are required.



8 Air conditioner compressor belt:

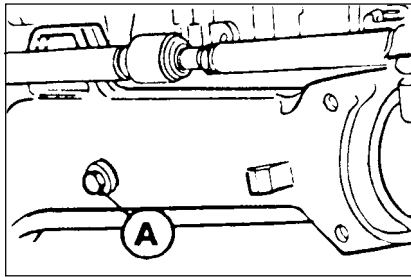
Check that give is approx. 1-1.5 cm (3/8-1/2"). Slacken screws (1 and 2) if adjustments are required.



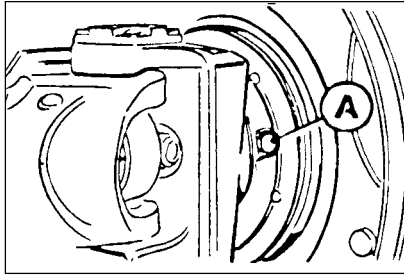
9 Hydraulic power lift and implement hitch:

Inject grease of the prescribed type (7 points).

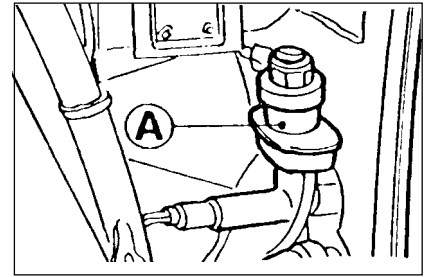
VARIABLE MAINTENANCE



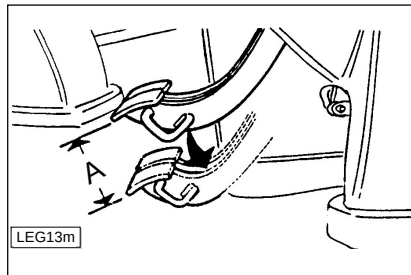
10 Front axle: Remove plug (A) and check the oil level. Top up if necessary through the same plug.



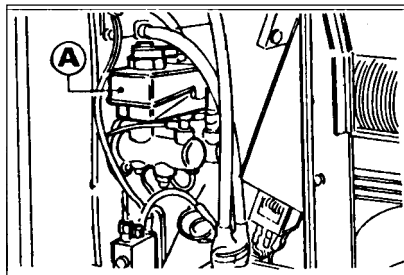
11 Front axle epicyclic final drives: Remove plug (A) and check the oil level (the plug should be horizontally aligned with the wheel hub). Top up if necessary through the same plug.



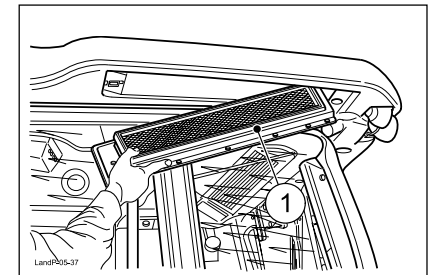
12 Clutch fluid reservoir (Speedsix and Powersix gearboxes): Check the level of the fluid in the reservoir (A). Top up with oil of the prescribed type if necessary.



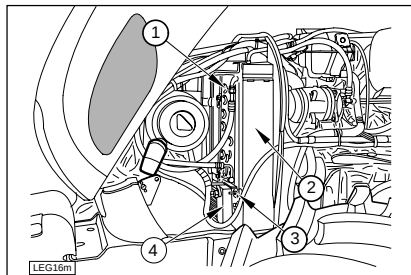
13 Brakes: After having operated the pedals three times, make sure that both pedals have a free travel (A) of 3-3.5 cm (1.38 in.). Consult the "Maintenance" chapter if adjustments are required.



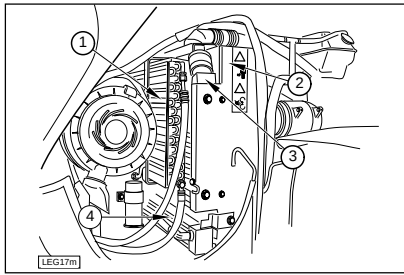
14 Brake fluid reservoir: Check the level of the brake fluid in the reservoir (A). Top up as necessary with the recommended fluid.



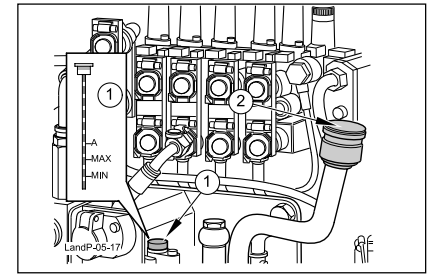
15 Cab air filters: Remove and clean the cab air filters (1). Refer to the "Maintenance" chapter.



16 Engine radiator (2) - A/C condenser (4) - Transmission oil radiator (1): Clean with a jet of compressed air blown from the inside towards the outside. Remove the radiator (1) after having loosened the retainer screw (3).



17 Mod 185 - Transmission oil radiator (1) - Engine radiator (2) - Intercooler (3) - A/C condenser (4): Clean with a jet of compressed air blown from the inside towards the outside. Remove the radiator (1) and the intercooler (3) for better cleaning.



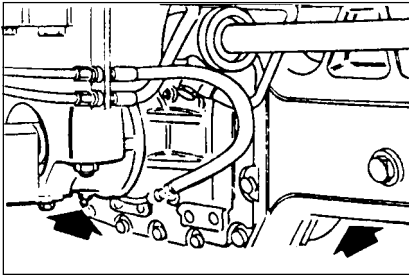
18 Gearbox and rear axle: Check the oil level using the dipstick (1). Top up the levels (2) using oil of the prescribed type.

19 Tyre pressure: Check and adjust the tyre pressures as indicated in the tables in the "Technical Specifications" chapter.

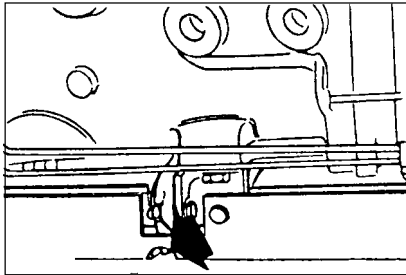
20 Wheel nuts: Make sure that the wheel nuts are torqued to the values indicated in the "Operation" chapter.

Maintenance

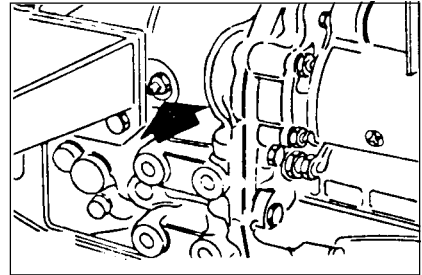
100 HOURS



21 Driving front axle pivot: Inject the recommended grease (2 points).

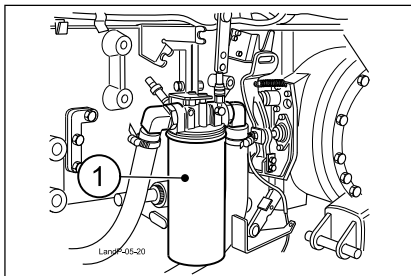


22 Front axle drive shaft bearing: Inject the recommended type of grease.

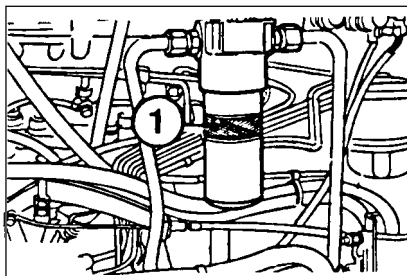


23 Techno - Mechanical PTO clutch sleeve: Grease with the recommended grease (max. two gun strokes) every 100 hours of effective service.

250 HOURS



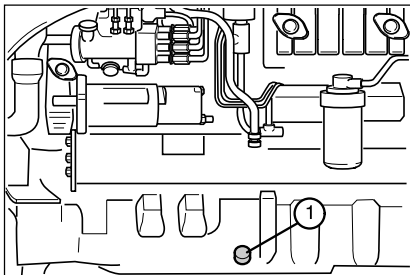
24 Oil filter on the intake of hydraulic power lift: Remove the container (1). Replace the cartridge, oil the seal and screw in the cartridge hand tight.



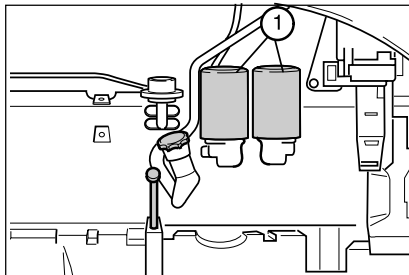
25 Oil filter on the steering circuit delivery side: Remove the holder (1) and change the inner filter element. Oil the seal and washer and fit them back correctly. Fit the holder (1) back on and screw it in hand tight.

NOTE: Operations 27 and 28 must be carried out whenever the hydraulic filter blockage warning light on the dashboard comes on.

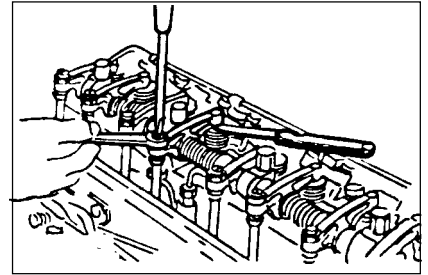
500 HOURS



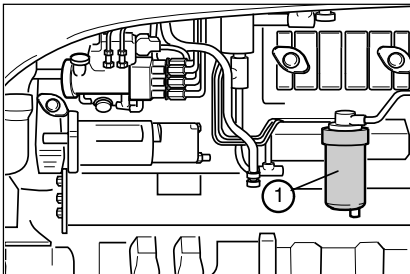
26 Engine oil: Drain the oil from the sump drain plug (1). Refit the plug and refill with the recommended oil (see op. 4 and 26).



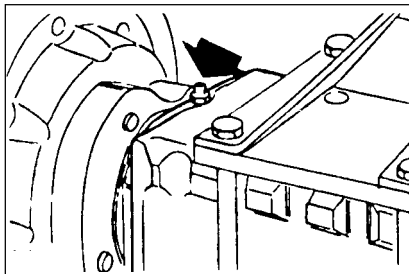
27 Engine oil filter: Replace the filter cartridge (4). Smear the seal of the new cartridge with oil and screw hand tight (carry out together with op. 25).



28 Valve clearance: Have the valve clearance checked. Consult the Technical Specifications in the Operation and Maintenance Manual for the clearance values.



29 Fuel filters: Replace the fuel filter cartridge (1) and clean the filter bowl. Bleed air from the fuel system, if necessary.

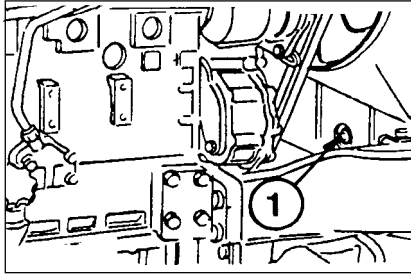


30 Rear axle shaft bearings mod. 145-165-185: Inject grease of the recommended type (maximum 25 pump strokes).

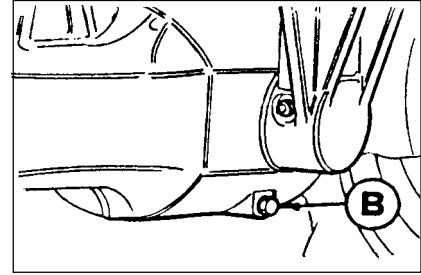
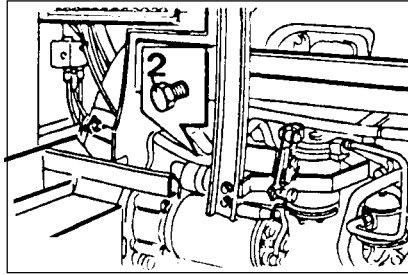
31 Closed circuit breather unit (if mounted): Have the closed circuit motor breather unit (if mounted) replaced by your dealer every 500 hours. The whole unit should be replaced every 8000 hours or on occasion of an engine overhaul.

Maintenance

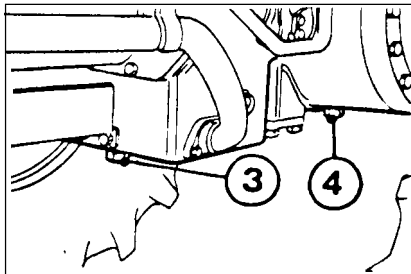
1000 HOURS



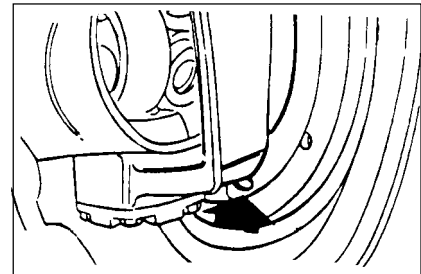
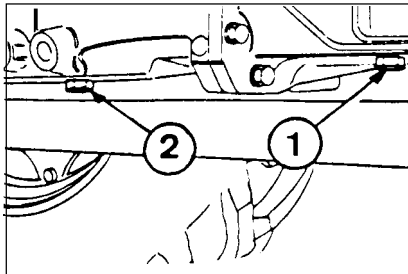
32 Engine cooling system: Open the drain plugs of the radiator (1) and cylinder block (2) and allow the fluid to drain out. Flush out the cooling system). See Operation and Maintenance manual.



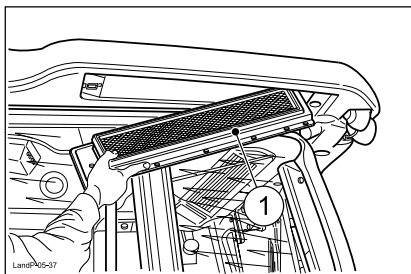
33 Front differential housing: Remove the drain plug (B). Drain out the old oil. Fill with new oil of the prescribed type up to the required level (see op. 10).



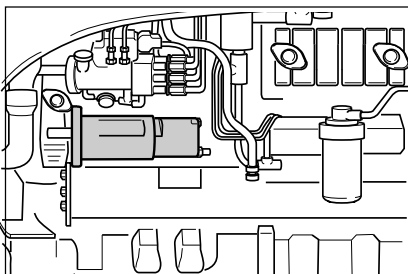
34 Gearbox and rear axle: Remove plugs (1-2-3) (set in the lowest position) from the gearbox housing and rear axle (4) (5 plugs) and drain out the oil. Clean the plugs and replace. Refill with clean oil to the required level (op. 17).



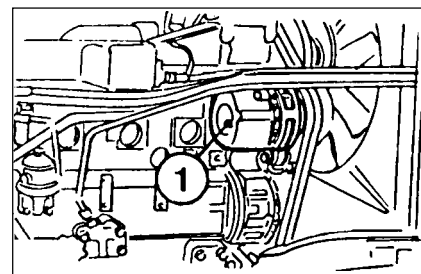
35 Front axle epicyclic final drives: Remove plug (A) and allow the oil to drain out. Pour in new oil of the prescribed type (see op. 11).



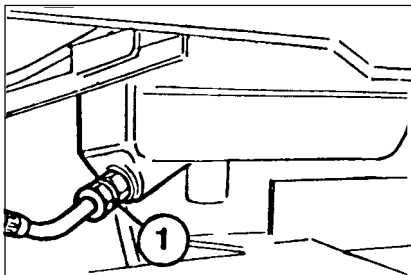
36 Cab air filters: Remove the old cab air filters (1) and fit new ones in.



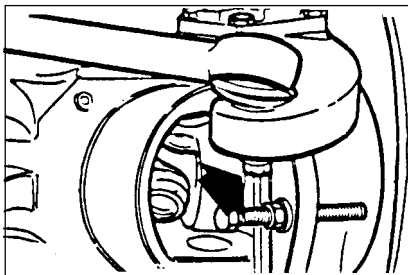
37 Starter motor: Have the commutator and brushes checked by an authorized service center.



38 Alternator: Have alternator (1) efficiency checked by an authorized service center.



39 Fuel tank: When the tank is nearly empty, remove the fitting (1) and drain out any sludge. Bleed the fuel system if necessary.



40 Knuckle joints for the steering cylinder: Have the knuckle joint nuts checked by an authorized service center after the first 50 hours and then after every 1000 hours service.

41 Injectors: Have the injectors checked by an authorized service center.

IMPORTANT:
Operations marked with a circle must only be carried out by authorized repair shops

Electrical system

ELECTRICAL SYSTEM

Battery

Your tractor is equipped with a "Maintenance Free" battery which will rarely need checking for electrolyte level or charge under normal conditions.

However, you are advised to check the level of the electrolyte occasionally and top up with distilled water if necessary.

If you need to top up frequently, have your charging system checked.

The engine should be stopped, the battery cold and the tractor parked on level ground to check or top up the battery. Proceed as follows (Fig. 5-42).

- 1 - Loosen the knob (1) and unscrew the ladder retainer (3). Open the ladder with the battery support.
- 2 - Remove the battery terminals (4) and the battery cover (2).
- 3 - Remove the battery caps and check the level.
- 4 - Carefully add distilled water if necessary until the level just covers the tops of the battery plates.
- 5 - Replace the caps and close the battery chamber.

Hints on battery care

Comply with the following hints to get the best from your battery:

- Keep the battery clean, particularly on top.
- Only use distilled water to top up.
- Check regularly that the battery terminals are firm and tight.
- Use a spanner of the right size to loosen and tighten the battery terminal nuts. Never use pliers.
- Smear the battery terminals with pure Vaseline to protect against corrosion. Never use ordinary grease.
- Never allow the battery to run down completely. Have it recharged once a month if possible.



WARNING: Battery electrolyte contains sulphuric acid and can cause serious burns. Avoid contact with the skin and eyes. Keep naked flames, sparks and lighted cigarettes well clear of batteries which are being charged. Keep the area in which batteries are being charged well ventilated.

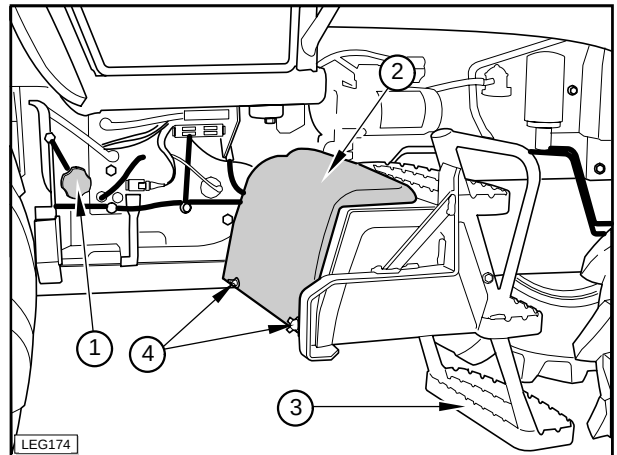


Fig.5-42

Battery switch

The battery can be completely disconnected by the electrical system by means of the switch (1 - Fig.5-43).

Turn the switch in anti-clockwise direction to disconnect the battery.

Turn the switch in clockwise direction to connect the battery again.

Always operate the switch only after removing the ignition key or turning it in the OFF position.

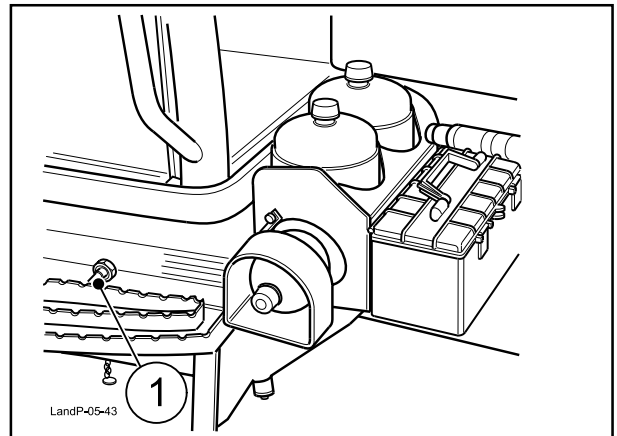


Fig.5-43

WARNING:

Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash your hands after handling.

Electrical system

Starter motor

Every 1000 hours, or once a year, clean the starter motor thoroughly and, in particular, check whether the brushes and collector are worn.

Alternator

The alternator keeps the battery fully charged.

The alternator is a brushless model and requires no special maintenance. However, the following precautions must be observed.

- 1 - When fitting a battery, make sure that the positive and negative terminals are connected to the same leads as the alternator. If you make the wrong connection, you will short circuit the battery through the alternator diodes. This not only discharges the battery but also burns out the diodes and leads.
- 2 - When connecting the battery to a charger, make sure that the positive (+) lead of the charger is connected to the positive of the battery, and the negative (-) to the negative. Incorrect connection will damage the alternator diodes and other circuit components.
- 3 - Never run the alternator unless it is properly connected. If the battery is not connected, high voltages can build up inside the alternator that can be extremely dangerous if the output terminal is touched. Make sure that all connections are firm and tight before carrying out any inspections or tests on the electrical system.
- 4 - Never short circuit or earth any of the alternator terminals. This could damage the electrical system.
- 5 - Never invert the alternator connections. The battery and alternator earths must be of the same sign or the alternator diodes will be damaged.
- 6 - Always disconnect both the alternator terminals before undertaking any electric arc welding on the tractor.

Headlights

As you can use your tractor on public roads, the lighting must comply with the applicable traffic and road regulations. Periodically check headlight alignment in the following way:

Checking headlight alignment (Fig. 5-44 and 5-45).

- Halt the tractor on level ground facing a shaded wall (preferably white). The tractor must be unloaded and the tyres correctly inflated. Mark two crosses on the wall in front of the tractor headlights (Fig. 5-45).
- Reverse the tractor 5 meters (16.4 ft) away from the wall.
- Switch on the main beam. The center of each beam must be vertically aligned with the crosses on the wall. A maximum outward divergence of 130 mm (5 in.) is acceptable.
- Switch on the dipped beam. The line separating the lighted area from the dark area must fall below the crosses and must be separated from their centers by at least $\frac{1}{20}$ th of the height of the crosses from the ground.
- Adjust the headlight alignment screws to correct alignment as necessary (Fig. 5-44).

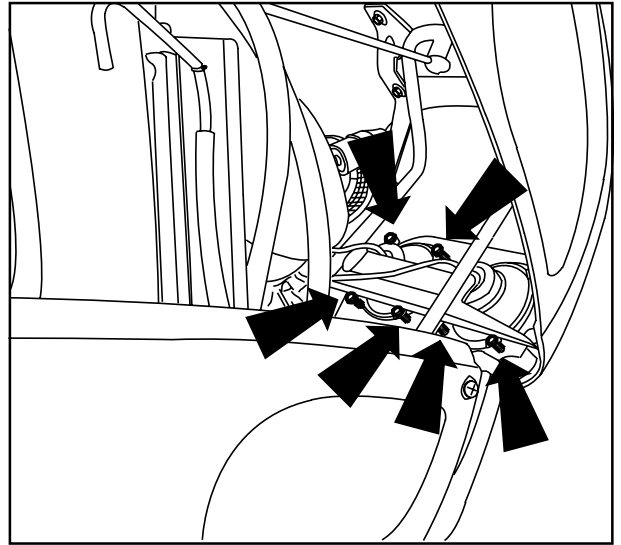


Fig.5-44

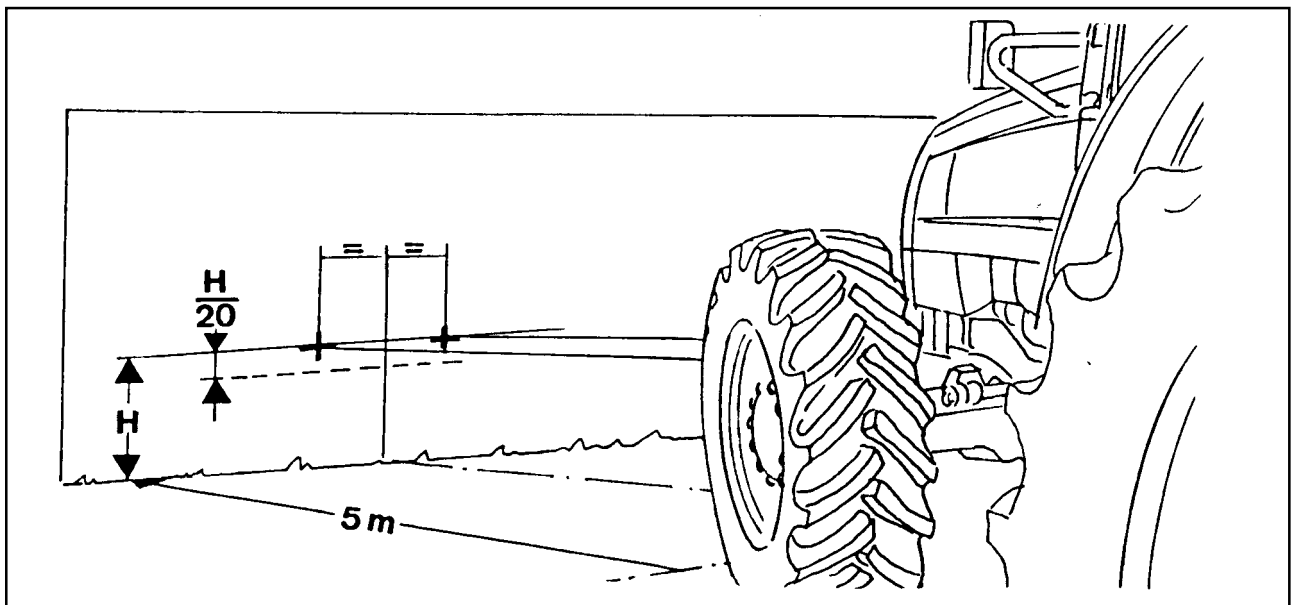


Fig. 5-45

Electrical system

FUSES AND RELAYS

The tractor's electrical system is protected against short-circuits and overload by a set of fuses. The number of fuses in the electrical system depends on the tractor version.

The fuses are installed in three fuse-boxes:

- FA - Main relay and fuse box (Fig. 5-49; Fig. 4-50) on the left-hand side of the dashboard.
- FB - Main relay and fuse box (Fig. 5-49; Fig. 4-50) on the left-hand side of the dashboard.
- C - Fuse in the battery chamber (Fig. 5-46; Fig.5-47; Fig.5-48).

NOTE: Before replacing a blown fuse with an equivalent one, try to identify and remedy the cause of the fault.

Fuses in the battery chamber

The fuses in the fuse box in the battery chamber are valid for all models (Fig. 5-46; Fig.5-47; Fig.5-48).

FUSES	PROTECTED CIRCUITS	Amp.
1	Fuse box - Fig. 5-46 Power unit Starter motor Alternator Glow plugs	80
2		80
3		100
4		80
5	Fuse on the alternator wire (Fig. 5-47)	80

Relays in the battery chamber - Fig. 5-48

K1	Engine ignition relay (red wires)
K2	Starter motor relay (green wires)
K3	Glow plug relay (black wires)

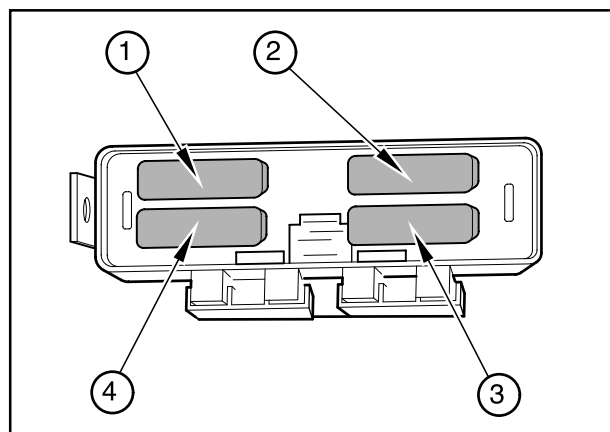


Fig.5-46 Fuse in the battery chamber

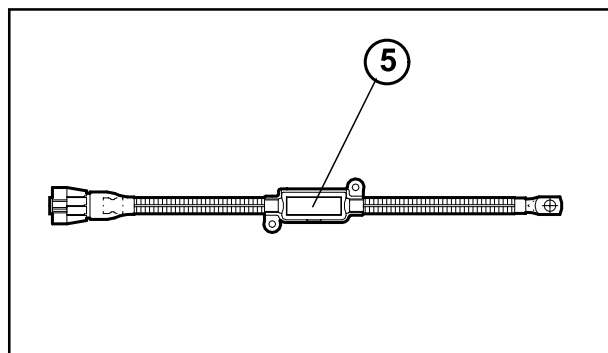


Fig.5-47 Fuses on the alternator wire

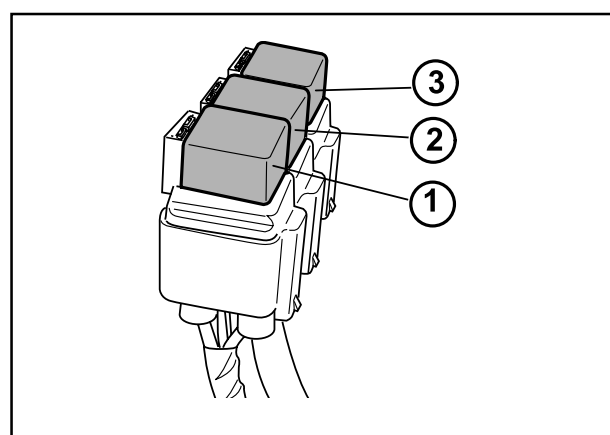


Fig.5-48 Relays in the battery chamber

Electrical system

FUSES AND RELAYS - Top-Tronic and suspended axle (if fitted)

Fuses and relays in the main fuse box on the left-hand side of the dashboard.(Fig. 5-49A and Fig.5-49B).

The fuses are installed in two boxes, FA and FB.

FUSES	PROTECTED CIRCUITS - Fig. 5-49A	Amp.
FA 1	Horn	5
FA 2	NAO card	7.5
FA 3	Emergency, key-operated	15
FA 4	Brake lights, lights, hazard lights	5
FA 5	Electronic power lift	7.5
FA 6	Instrument, key-operated	5
FA 7	Brake light	10
FA 8	Key operated power unit, suspended axle	7.5
FA 9	Engine power unit, key operated	5
FA 10	Top-Tronic power unit, key operated	15
FA 11	Pneumatic seat	10
FA 12	Cigarette lighter	10
FA 13	Front PTO	5
FA 14	Auxiliary socket, key operated	25
FA 15	Flow selector	5
FA 16	Exciter, key-operated	7.5
FA 17	Front windscreen wiper	10
FA 18	Rear window wiper	10
FA 19	Car radio	5
FA 20	-	-
FA 21	Spare fuses	-
FB 1	Side lights	5
FB 2	Side lights	5
FB 3	Driving beams	15
FB 4	Dipped beams	10
FB 5	Direct, engine	10
FB 6	Direct, instrument	5
FB 7	Direct, emergency	15
FB 8	Rotary beacon	7.5
FB 9	Air conditioner compressor	7.5
FB 10	Ceiling light	5
FB 11	Inner rear field lights	10
FB 12	Outer rear field lights	10
FB 13	Night lights	15
FB 14	Direct, auxiliary socket	7.5
FB 15	Direct, ignition key.	5
FB 16	Buzzer	5
FB 17	-	-
FB 18	-	-
FB 19	Inner front field lights	10
FB 20	Outer front field lights	10
FB 21	Spare fuses	-

MICRORELAYS Fig. 5-49A; Fig. 5-49B	
M1A	Brake lights
M2A	Rear PTO start lock
M3A	Front PTO start lock
M4A	Engine Danfoss power unit, key operated
M5A	Power unit, suspended axle
M6A	Stop, instrument, electronic power lift, key-operated
M1B	Seat, front PTO, cigarette lighter
M3B	Front/rear wipers, radio, ceiling light, key operated
M6B	Dual Power
M1C	Rear field lights, key operated
M2C	Front beams, key operated
M3C	Front field lights, key operated
M4C	Cruise Control
M5C	Dipped beams
M6C	Driving beams
M2D	Air conditioner
M4D	Auxiliary socket, flow selector, key operated

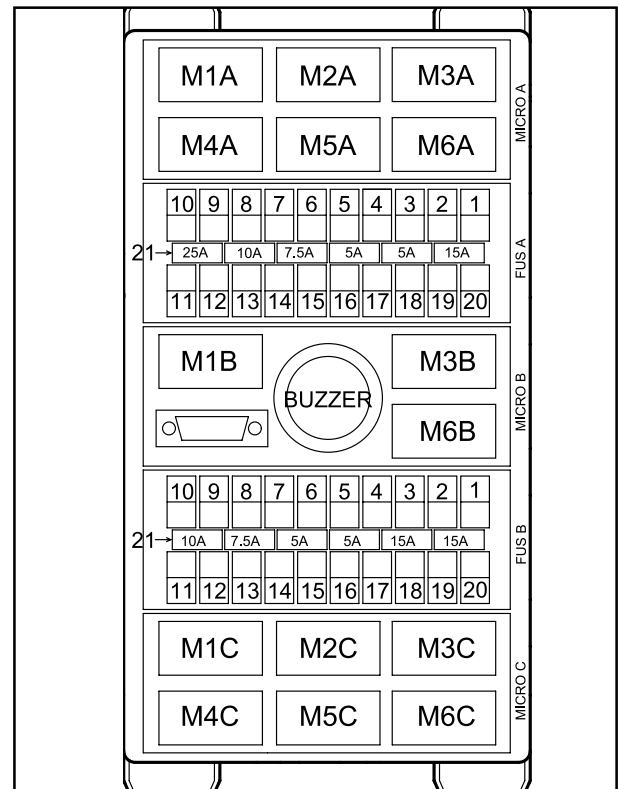


Fig.5-49 A - Front view

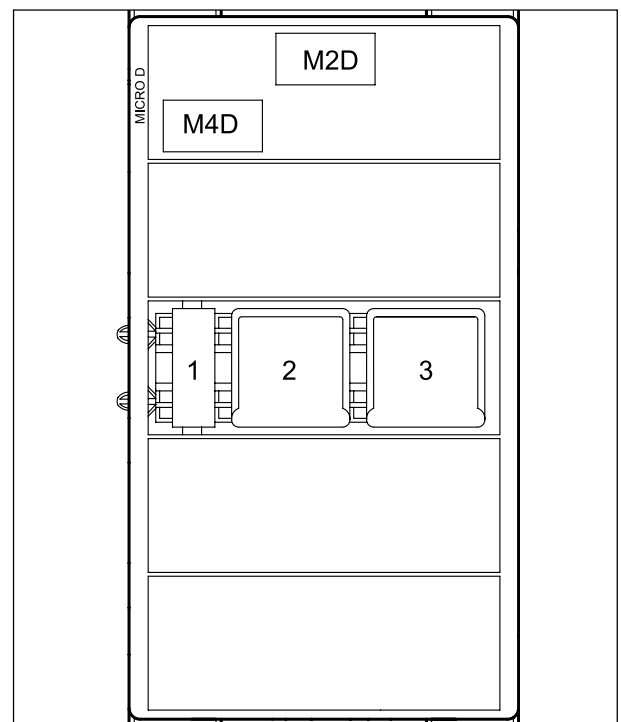


Fig.5-49 B - Rear view

MAXI-FUSES - RELAYS - Fig. 5-49B	
1	Maxifuse, air conditioning - 40A
2	Maxirelay, air conditioning 12V, 70A
3	Maxirelay, air conditioning 12V, 70A

Electrical system

FUSES AND RELAYS - Top - Powersix - Suspended axle (if fitted)

Fuses and relays in the main fuse box on the left-hand side of the dashboard. (Fig.5-50A and Fig.5-50B)

The fuses are installed in two boxes, FA and FB.

FUSES	PROTECTED CIRCUITS - Fig. 5-50A	Amp.
FA 1	Horn	5
FA 2	NAO card	7.5
FA 3	Emergency, key-operated	15
FA 4	Brake lights, lights, hazard lights	5
FA 5	Electronic power lift	7.5
FA 6	Instrument, key-operated	5
FA 7	Brake light	10
FA 8	Key operated power unit, suspended axle	7.5
FA 9	Engine power unit, key operated	5
FA 10	-	-
FA 11	Pneumatic seat	10
FA 12	Cigarette lighter	10
FA 13	Front PTO	5
FA 14	Auxiliary socket, key operated	25
FA 15	Flow selector	5
FA 16	Exciter, key-operated	7.5
FA 17	Front windscreen wiper	10
FA 18	Rear window wiper	10
FA 19	Car radio	5
FA 20	-	-
FA 21	Spare fuses	-
FB 1	Side lights	5
FB 2	Side lights	5
FB 3	Driving beams	15
FB 4	Dipped beams	10
FB 5	Direct, engine	10
FB 6	Direct, instrument	5
FB 7	Direct, emergency	15
FB 8	Rotary beacon	7.5
FB 9	Air conditioner compressor	7.5
FB 10	Ceiling light	5
FB 11	Inner rear field lights	10
FB 12	Outer rear field lights	10
FB 13	Night lights	15
FB 14	Direct, auxiliary socket	7.5
FB 15	Direct, ignition key.	5
FB 16	-	-
FB 17	Buzzer	5
FB 18	PTO power unit, key operated	15
FB 19	Inner front field lights	10
FB 20	Outer front field lights	10
FB 21	Spare fuses	-

MICRORELAYS Fig. 5-50A; Fig. 5-50B	
M1A	Brake lights
M2A	Front PTO start lock
M4A	Engine power unit, suspended axle power unit, key operated
M5A	Stop, instrument, electronic power lift, key-operated
M6A	Hazard, horn, NAO card, key operated
M1B	Seat, front PTO, cigarette lighter
M3B	Front/rear wipers, radio, ceiling light, key operated
M6B	Dual Power
M1C	Rear field lights, key operated
M2C	Front beams, key operated
M3C	Front field lights, key operated
M4C	Cruise Control
M5C	Dipped beams
M6C	Driving beams
M2D	Air conditioner
M4D	Auxiliary socket, flow selector, key operated

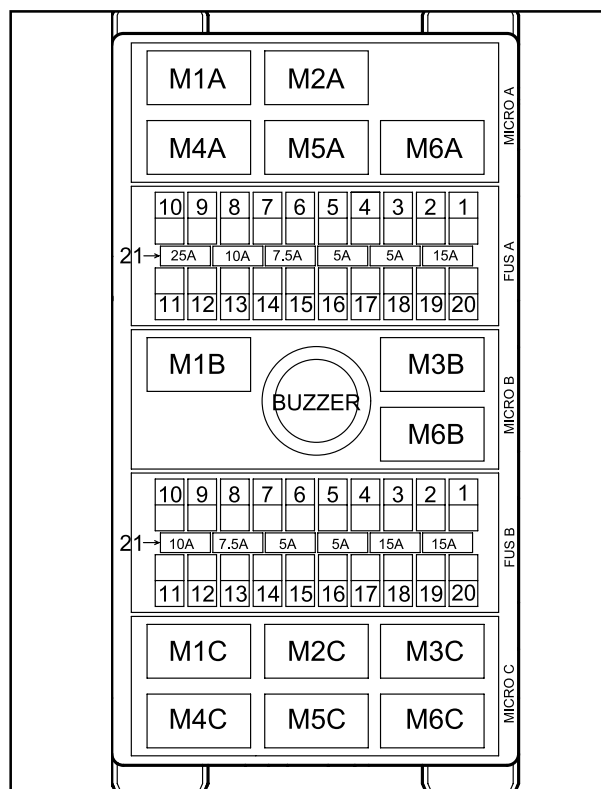


Fig.5-50A - Front view

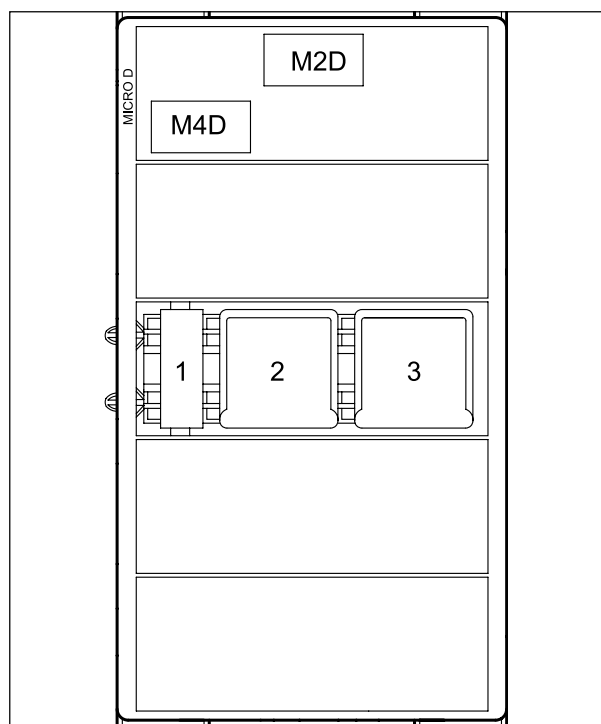


Fig.5-50B - Rear view

MAXI-FUSES - RELAYS - Fig. 5-50B	
1	Maxifuse, air conditioning - 40A
2	Maxirelay, air conditioning 12V, 70A
3	Maxirelay, air conditioning 12V, 70A

Electrical system

7-pin power socket for trailer

(Fig. 5-51)

A 7-pin power socket is installed on the rear of the tractor. This socket is used to connect the light circuits of the trailer.

Connections and correspondances for 7-pin power socket according to ISO-SAE standards.

1. Lh turn indicator; 2. Not used; 3. Earth; 4. Rh turn indicator; 5. Rh rear side light; 6. Brake lights; 7. Lh rear side light.

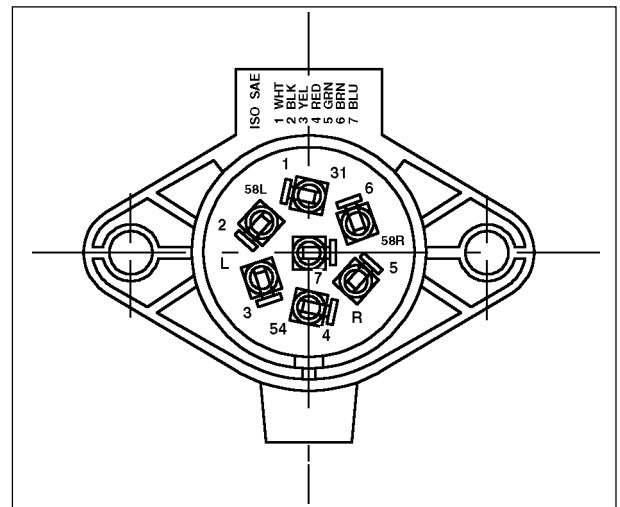


Fig.5-51

Auxiliary power socket (Fig. 5-52)

On the rear of the dashboard, on the right of the operator, is installed an auxiliary power socket 12V.

Connections (Fig.5-52)

- 1- Key-operated positive - Max. load 5A
- 2- Negative
- 3- Direct battery positive - Max. load 25A

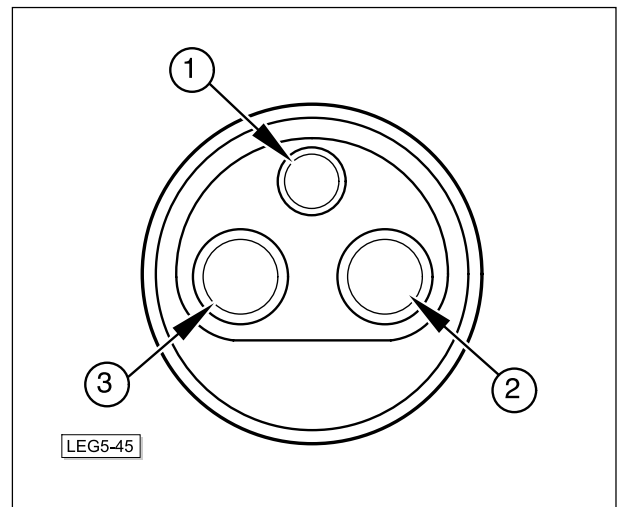


Fig.5-52

Electrical system

Field lights

Front field light - Fig.5-53

Rear field lights - Fig.5-54

- 1 - Turn the field light (1) to access the lamp to be replaced.
- 2 - Rotate the lamp in a clockwise direction and remove it,
- 3 - Fit a new lamp (1). Remember not to touch the lamp surface with your fingers.
- 4 - Adjust the field light position as required.

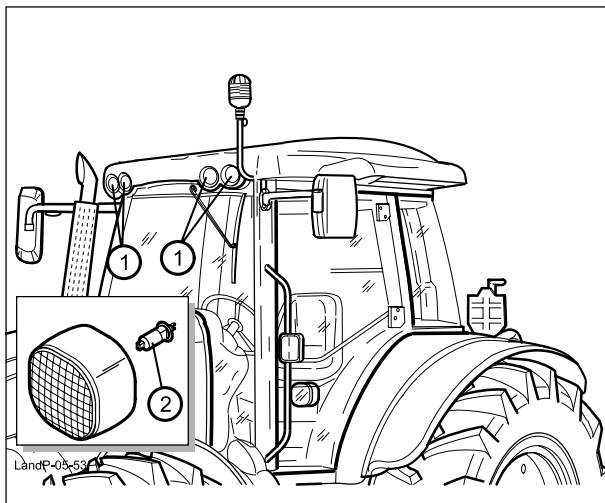


Fig.5-53

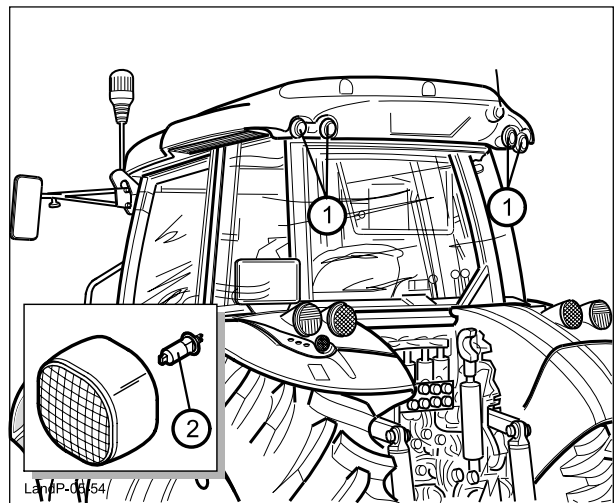


Fig.5-54

Long idle periods

Take the following precautionary measures when your tractor is not going to be used for a long period of time.

- park the tractor in a dry, sheltered place
- drain the coolant from the radiator and engine
- grease all points provided with grease nipples
- clean the fuel filter
- remove the injectors and squirt a small quantity of engine oil into the cylinders. Turn the engine over by hand, then fit the injectors back in place
- generally clean the tractor, particularly the bodywork components. Protect the painted parts by applying silicone wax and the unpainted metal parts by applying protective lubricant. Park the tractor in a dry, sheltered and possibly ventilated place.
- make sure that all controls are in neutral (including the electric switches and parking brake controls)
- remove the ignition key from the ignition switch
- make sure that the cylinder stems (of the power steering, power lift systems, etc.) are positioned
- empty the fuel tank and fill it with new diesel fuel until the maximum level is reached
- remove the battery, clean the cover and spread Vaseline on the terminals and terminal caps. Now connect the battery in a ventilated place where the temperature is not liable to drop below 10°C and where it is not exposed to direct sunlight
- check the battery charge with a voltmeter as described in the battery part of this section. Recharge it is necessary
- place stands or other supports under the axles in order to take the weight off the wheels. When the tractor is raised in this way, it is advisable to deflate the tyres. If this is not possible, the tyre pressure must be periodically checked.
- cover the tractor with a tarpaulin (not plastic or waterproof).



CAUTION: *At the end of the idle period, when you start the engine again, pay particular attention to the instructions about starting the engine in the Operation chapter.*

Electrical system

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Technical specifications

Chapter 6

Technical specifications

6

Technical specifications

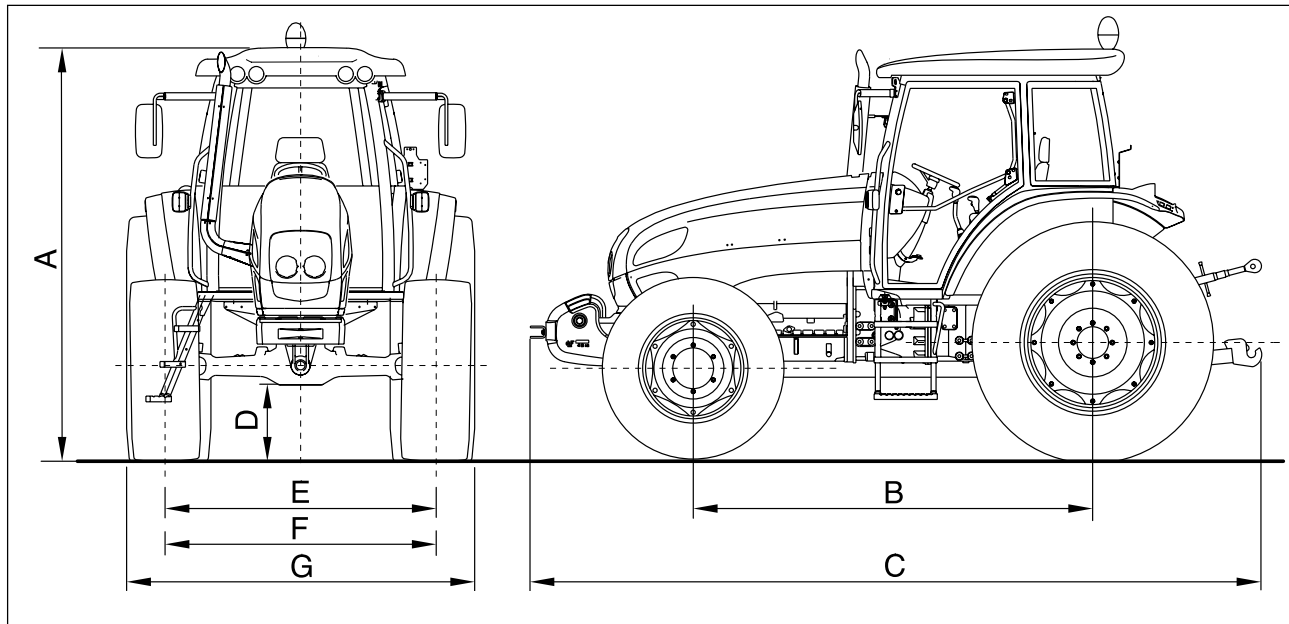


Fig. 6-1A

General data

With tyres

- front
- rear

Weights

- In running order, without ballast, with cab

Dimensions

- A - Height from ground to cab top
- Height to rotating beacon
- Height to ROPS
- B - Wheelbase
- C - Max. length without front ballast
- Max. length with front ballast
- D - Ground clearance
- E - Front track
- F - Rear track
- G - Max. width on road

125TDI	135TDI
4 WD	4 WD
380/70R28 480/70R38	14.9R28 18.4R38
5500	5500
2810	2810
2970	2970
2810	2810
2800	2800
4160	4160
5120	5120
470	498
See track tables	See track tables
2500	2500

Technical specifications

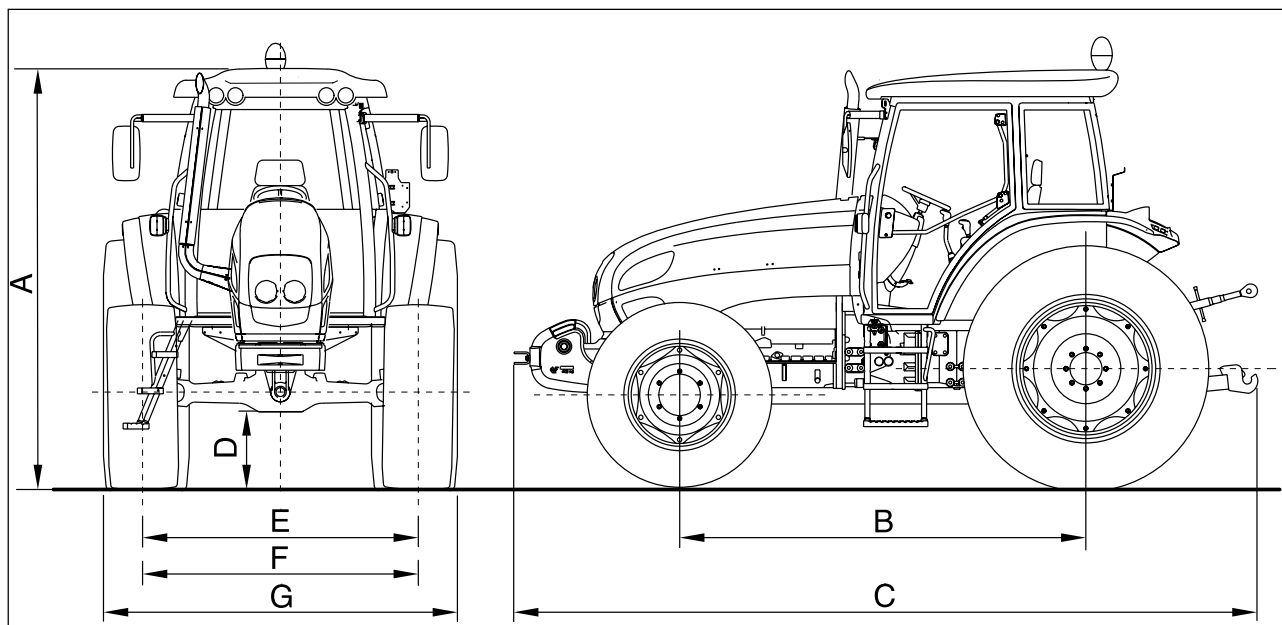


Fig. 6-1B

General data

With tyres

- front
- rear

Weights

- In running order, without ballast, with cab kg

Dimensions

- A - Height from ground to cab top mm
- Height to rotating beacon mm

- B - Wheelbase mm

- C - Max. length with front ballast mm

- D - Ground clearance mm

- E - Front track mm

- F - Rear track mm

- G - Max. width on road mm

145TDI	165TDI	185TDI
4 WD	4 WD	4 WD
480/65R28 600/65R38	540/65R28 650/65R38	540/65R28 600/65R42
5600	6100	6250
2820 2980	2820 2980	2890 3050
2800	2800	2800
5120	5230	5440
498	498	520
See track tables	See track tables	See track tables
2500	2500	2500

Technical specifications

Engine

Type

Model

Fuel supply

Number of cylinders

Bore mm

Stroke mm

Swept volume ccm

Compression ratio

Power rating (ISO) HP/kW

Rated speed RPM

Max. torque Nm

Max. torque speed RPM

Idling speed RPM

Cylinder liners

Timing system

Type

Tappet gap, cold engine:

- Intake (mm)
- Exhaust (mm)

Spark advance angle, before TDC

Fuel system

Fuel pump

Rotary injection pump

Filters on injection pump delivery

Firing order

Cold starting device

Air filter

Ejector for air filter

125TDI		135TDI	
"Green" engines according to specifications of standards EURO2 and TIER 2			
Perkins Diesel, 4 stroke direct injection			
	1106C.E60TA		1106C.E60TA
Turbo	Turbo		
	vertical straight 6		
	100		100
	127		127
	6000		6000
	17.5:1		17.5:1
	117.6/86.5		134.0/98.5
	2200		2200
	487		555
	1400		1400
	1050		1050
	Cast iron, dry, extractable		
Overhead valves controlled by tappets			
	0.20	0.20	0.20
	0.45	0.45	0.45
	-		-
AC-DELCO, membrane type, with hand primer			
	Rotary type		
	1		1
	1,5,3,6,2,4		
	Thermostarter		
	With two dry elements removable for maintenance		
	on request		

Technical specifications

Engine

Type

"Green" engines according to specifications EURO 2 and TIER 2

Make

Perkins Diesel, 4 stroke

Model

1106C-E60TA

1106C-E60TA

1106C-E60TA

Fuel supply

Turbo

Turbo

Turbo

Number of cylinders

6 vertical straight

Bore

mm

100

100

100

Stroke

mm

127

127

127

Swept volume

ccm

6000

6000

6000

Compression ratio

17.25:1

17.25:1

17.25:1

Power rating ISO

CV/KW

145.5/107

163.2/120

183.5/134.9

Power rating ISO Dual Power*

CV/KW

155/113,9

172,6/126,9

-

Rated speed

RPM

2200

2200

2200

Max. torque

Nm

604

641

695

Max. torque speed

RPM

1400

1400

1400

Idling speed

RPM

1050

1050

1050

Cylinder liners

Cast iron, dry, extractable

Timing system

Type

Overhead valves controlled by tappets

Tappet gap, cold engine:

- Intake (mm)

0.20

0.20

0.20

- Exhaust (mm)

0.45

0.45

0.45

Fuel system

Fuel pump

AC-DELCO, membrane type, with hand primer

Injection pump

Rotary type

Filter on injection pump delivery

1

1

1

Firing order

1,5,3,6,2,4

Injector pressure setting (bar)

-

-

-

Cold starting device

Thermostarter

Air filter

With two dry elements removable for maintenance

Ejector for air filter

on request

* Dual Power, if provided

Technical specifications

Lubrication

Forced lubrication from pump operated by the gears of the timing system.

Oil filtration by:

- Gauze filter on the pump intake.
- Replaceable cartridge filter on the engine delivery line.

Oil pressure (with engine at maximum rated power speed): 3.5/4.2 bar (50-60 psi).

Cooling

Water cooling, forced circulation by centrifugal pump operated by the gears of the timing system.

Vertical tube type radiator.

Mod. 125-135-145: suction fan controlled by V-belts.

Mod. 165-185: viscostatic suction fan.

Double thermostat control for water circulation from the engine to the radiator.

Starting temperature: 77°/85°C (163-187°F)

Antifreeze is required for very low temperatures (see "Maintenance" chapter).

Engine starting

Thermostarter cold weather starting device for starting in low temperatures.

Clutch

Top-Techno: 14" (355 mm) diameter single disc dry clutch with cerametallic plates.

Hydrostatic power control with automatic play adjustment.

Top-Tronic: Two disk oil-cooled clutches of Top-Tronic unit.

Transmission

Gearbox

Speedsix gearbox with helical gears and 6 synchronized speeds with 3 speed Ranges (Low - Standard - High) offering 18 forward speeds and 18 reverse speeds by means of the synchronized reverse shuttle.

The sixth gear cannot be engaged in high range in the 30 kph max. version, thus there are: 17 forward speeds and 17 reverse speeds (for export markets only).

Creeper (mounted on request) with a 5.357 reduction ratio allowing all the speeds of the basic Speedsix gearbox to be reduced by 80%, thus giving 36 forward speeds and 36 reverse speeds.

In the 30 kph max. version: 34 forward speeds and 34 reverse speeds (for export markets only).

Powersix Top only, can be mounted on request). This is an electro-hydraulically engaged final drive with a 1.2037 reduction ratio that allows all the speeds of the basic gearbox to be reduced by 20%, obtaining:

- Mounted with the basic Speedsix gearbox only: 36 forward speeds and 36 reverse speeds.
- Mounted with the Speedsix gearbox and Creeper: 72 forward speeds and 72 reverse speeds.
In the 30 kph version, these become (for export markets only):
- With Speedsix alone: 34 forward speeds and 34 reverse speeds.
- With Speedsix and Creeper: 68 forward speeds and 68 reverse speeds.

The Top-Tronic gearbox allows to hydraulically engage 3 speed ranges with electro-hydraulic shuttle. Together with the creeper, a total of 108 forward and 36 reverse gears to be obtained.

Reduction ratio of bevel gear pair and rear final drives

L125 - L135

Bevel gear pair (11/47).....	4.2727
Reduction ratio of epicyclic final drives	5.7857
Total reduction ratio.....	24.7207

L145-L165-L185

Bevel gear pair (11/47).....	4.2727
Reduction ratio of epicyclic final drives	6.230
Total reduction ratio	26.6189

* L165-L185 have a 15 mm wider gear belt.

WARNING: *These technical specifications are of a general character. Consult your dealer's brochures for the specific characteristics available in each individual country.*

Technical specifications

Ground speed table

The following table gives the various speeds, in kph, which different types and versions of the tractor can reach at maximum speed rate. The table shows the speeds of the basic 40 kph max. gearbox, comprising 18* standard speeds and 18* speeds with the reverse shuttle.

The table also gives the supplementary speeds that can be obtained when one of the following

"OPTIONALS" is added to the basic gearbox:

- CREEPER (80% reduction) The Creeper should only be used in the Low Range.
- POWER-SIX (20% reduction)
- POWER-SIX and CREEPER together

* The sixth gear cannot be engaged in high range with the 30 kph max. speed basic gearbox (for Export markets only).

**Power-Six is only available with Top.

Models L125 - L135

Speeds in kph with the engine at 2200 RPM and rear tyres as shown: (mph: multiply kph by .621)

		RANGE	GEAR	REAR TYRES							
				16.9 R 38 480/70 R 38				18.4 R 38 520/70 R 38			
				STANDARD SPEEDS GEARBOX	** POWERSIX ONLY Legend Top	CREEPER	** POWERSIX AND CREEPER	STANDARD SPEEDS GEARBOX	** POWERSIX ONLY Legend Top	CREEPER	** POWERSIX AND CREEPER
FORWARD GEARS		Low	1	1.83	1.52	0.34	0.28	1.89	1.57	0.35	0.29
			2	2.36	1.96	0.44	0.37	2.44	2.03	0.46	0.38
			3	3.06	2.54	0.57	0.48	3.15	2.62	0.59	0.49
			4	3.94	3.28	0.74	0.62	4.07	3.38	0.76	0.63
			5	5.07	4.21	0.95	0.79	5.23	4.35	0.98	0.81
			6	6.73	5.59	1.26	1.04	6.94	5.77	1.30	1.08
		Standard	1	4.55	3.78	0.85	0.71	4.70	3.90	0.88	0.73
			2	5.87	4.88	1.10	0.91	6.06	5.03	1.13	0.94
			3	7.61	6.32	1.42	1.18	7.84	6.52	1.46	1.22
			4	9.79	8.13	1.83	1.52	10.09	8.39	1.88	1.57
			5	12.61	10.47	2.35	1.95	13.00	10.80	2.43	2.02
			6	16.72	13.89	3.12	2.59	17.25	14.33	3.22	2.67
		High*	1	10.77	8.95	2.01	1.67	11.11	9.23	2.07	1.72
			2	13.89	11.54	2.59	2.15	14.33	11.90	2.67	2.22
			3	17.98	14.94	3.36	2.79	18.55	15.41	3.46	2.88
			4	23.15	19.23	4.32	3.59	23.88	19.84	4.46	3.70
			5	29.80	24.75	5.56	4.62	30.74	25.53	5.74	4.77
			6	39.57	32.87	7.39	6.14	40.82	33.90	7.62	6.33
REVERSE SHUTTLE		Low	1	1.90	1.58	0.36	0.30	1.96	1.63	0.37	0.30
			2	2.45	2.04	0.46	0.38	2.53	2.10	0.47	0.39
			3	3.18	2.64	0.59	0.49	3.27	2.72	0.61	0.51
			4	4.09	3.40	0.76	0.63	4.22	3.50	0.79	0.65
			5	5.26	4.37	0.98	0.82	5.43	4.51	1.01	0.84
			6	6.98	5.80	1.30	1.08	7.20	5.98	1.34	1.12
		Standard	1	4.72	3.92	0.88	0.73	4.87	4.05	0.91	0.76
			2	6.09	5.06	1.14	0.95	6.20	5.22	1.17	0.97
			3	7.89	6.55	1.47	1.22	8.13	6.76	1.52	1.26
			4	10.15	8.44	1.90	1.56	10.47	8.70	1.96	1.62
			5	13.07	10.86	2.44	2.03	13.48	11.20	2.52	2.09
			6	17.34	14.41	3.24	2.69	17.89	14.86	3.34	2.77
		High	1	11.17	9.28	2.09	1.73	11.52	9.57	2.15	1.79
			2	14.41	11.97	2.69	2.23	14.86	12.35	2.77	2.31
			3	18.65	15.50	3.48	2.89	19.24	15.98	3.59	2.98
			4	24.01	19.95	4.48	3.72	24.77	20.58	4.62	3.84
			5	30.91	25.68	5.77	4.79	31.88	26.48	5.95	4.94
			6	41.04	34.09	7.66	6.36	42.33	35.17	7.90	6.56

Technical specifications

Ground speed table

The following table gives the various speeds, in kph, which different types and versions of the tractor can reach at maximum speed rate. The table shows the speeds of the basic 40 kph max. gearbox, comprising 18* standard speeds and 18* speeds with the reverse shuttle.

The table also gives the supplementary speeds that can be obtained when one of the following

"OPTIONALS" is added to the basic gearbox:

- CREEPER (80% reduction) The Creeper should only be used in the Low Range.
- POWER-SIX (20% reduction)
- POWER-SIX and CREEPER together

* The sixth gear cannot be engaged in high range with the 30 kph max. speed basic gearbox (for Export markets only).

**Power-Six is only available with Top.

Models L145 - L165 - L185

Speeds in kph with the engine at 2200 RPM and rear tyres as shown: (mph: multiply kph by .621)

		GEAR	REAR TYRES							
			L145				L165 - L185			
			18.4 R 38 520/70 R 38 600/65 R 38				20.8 R 38 580/70 R 38 650/65 R 38			
			STANDARD SPEEDSIX GEARBOX	** POWERSIX ONLY Legend Top	CREEPER	** POWERSIX AND CREEPER	STANDARD SPEEDSIX GEARBOX	** POWERSIX ONLY Legend Top	CREEPER	** POWERSIX AND CREEPER
 FORWARD GEARS	 Low	1	1.76	1.46	0.33	0.27	1.83	1.52	0.34	0.28
		2	2.26	1.88	0.42	0.35	2.36	1.96	0.44	0.37
		3	2.93	2.44	0.55	0.45	3.06	2.54	0.57	0.47
		4	3.78	3.14	0.70	0.58	3.94	3.27	0.73	0.61
		5	4.86	4.04	0.91	0.75	5.07	4.21	0.95	0.79
		6	6.45	5.36	1.20	1.00	6.72	5.58	1.25	1.04
	 Standard	1	4.36	3.62	0.81	0.68	4.55	3.78	0.85	0.70
		2	5.63	4.67	1.05	0.87	5.87	4.87	1.09	0.91
		3	7.28	6.05	1.36	1.13	7.59	6.31	1.42	1.18
		4	9.38	7.79	1.75	1.45	9.78	8.12	1.82	1.52
		5	12.07	10.03	2.25	1.87	12.59	10.46	2.35	1.95
		6	16.02	13.30	2.99	2.48	16.70	13.87	3.17	2.59
	 High *	1	10.32	8.57	1.93	1.60	10.76	8.93	2.01	1.67
		2	13.30	11.05	2.48	2.06	13.87	11.52	2.59	2.15
		3	17.23	14.31	3.22	2.67	17.96	14.92	3.35	2.78
		4	22.18	18.42	4.14	3.44	23.13	19.20	4.32	3.58
		5	28.55	23.71	5.33	4.42	29.77	24.72	5.56	4.61
		6	37.88	31.48	7.07	5.88	39.50	32.82	7.38	6.13
 REVERSE SHUTTLE	 Low	1	1.82	1.51	0.34	0.28	1.90	1.58	0.35	0.29
		2	2.35	1.95	0.44	0.36	2.45	2.03	0.46	0.38
		3	3.04	2.53	0.57	0.47	3.17	2.63	0.59	0.49
		4	3.92	3.25	0.73	0.61	4.08	3.39	0.76	0.63
		5	5.04	4.19	0.94	0.78	5.25	4.36	0.98	0.81
		6	6.69	5.55	1.25	1.04	6.97	5.79	1.30	1.08
	 Standard	1	4.52	3.76	0.84	0.70	4.72	3.92	0.88	0.73
		2	5.83	4.85	1.09	0.90	6.08	5.05	1.14	0.94
		3	7.55	6.28	1.41	1.17	7.88	6.54	1.47	1.22
		4	9.72	8.08	1.82	1.51	10.14	8.42	1.89	1.57
		5	12.52	10.40	2.34	1.94	13.05	10.85	2.44	2.02
		6	16.61	13.80	3.10	2.58	17.32	14.39	3.23	2.69
	 High	1	10.70	8.89	2.00	1.66	11.16	9.27	2.08	1.73
		2	13.80	11.46	2.58	2.14	14.39	11.95	2.69	2.23
		3	17.86	14.84	3.34	2.77	18.63	15.47	3.48	2.89
		4	23.00	19.11	4.29	3.57	23.98	19.92	4.48	3.72
		5	29.60	24.59	5.53	4.59	30.87	25.64	5.76	4.79
		6	39.30	32.66	7.34	6.10	40.98	34.05	7.65	6.36

Technical specifications

Differential lock

Top and Top-Tronic: Rear differential lock with electro-hydraulic control and hydraulic engagement by means of an oil-cooled multiple disc clutch: 5 discs.

Legend Techno: Rear differential lock with electro-hydraulic control and mechanical engagement.

In both models, the diff lock is disengaged by means of the brake pedals.

Front and rear differential locking takes place at the same time by means of the Twin-Lock system in four-wheel drive tractors.

Power take-off

Independent PTO synchronized with gearbox, mounted at the rear of the tractor.

PTO engaged through a hydraulic clutch with electro-hydraulic control by means of a button in the cab. Engagement is modulated by a hydraulic accumulator. The PTO driveline is stopped through an electro-hydraulically controlled brake by means of the switch used to control the PTO itself.

Operation: independent or proportional to ground speed.

1-Rotation speed in independent mode:

- 540 RPM with a 1944 RPM engine rate.
- 540ECO RPM with a 1322 RPM engine rate (available on request, known as economy power take-off).
- 1000 RPM with a 1956 RPM engine rate.

2-Rotation speed in synchronized mode (PTO driveline turns per rear wheel turn):

Type of PTO	PTO driveline revolutions	
	L125 - L135	L145 - L165 - L185
540	11.26	12.126
540ECO	16.54	17.818
1000	20.627	22.312

Different PTO output shafts are available, in compliance with A.S.A.E. standards.

- 1 3/8" (34.9 mm) diameter shaft with 21 splines (standard assembly).

- 1 3/8" (34.9 mm) diameter shaft with 6 splines (on request).
- 1 3/4" (44.45 mm) diameter shaft with 6 splines (on request).
- 1 3/4" (44,45 mm) diameter shaft with 20 splines (on request).

Brakes

Rear brakes

Multidisc oil-cooled brakes mounted on rear differential half shafts.

Number of friction discs..... 10 (5 per side).

Friction material..... resin-graphite.

Hydraulic control by means of the two pedals on the driver's right: the two pedals can be coupled together by a locking device to provide simultaneous braking action on both sides.

Parking brake controlled by an independent hand lever and linkage acting directly on the main brakes.

Hydraulic trailer brake mounted on request.

Compressed air trailer brake mounted on request.

Front brakes (4WD only)

Multidisc oil-cooled brakes mounted on front differential half shafts.

Number of friction discs:

All models..... 4 (2 per side).
Friction material..... resin-graphite.

IBS-Integral Braking System hydraulic control ensuring simultaneous braking along with the rear brakes when the brake pedals are coupled together by means of the relative locking device.

Track adjustment

Track is adjustable on 2WD and 4WD front axles and on rear axles. See the Tables in the "Operation" chapter.

Technical specifications

Steering components

Power steering

Power steering system controlled by the steering wheel.

Telescopic steering wheel adjustable in height and tilt.

Turns on the steering wheel (from one stop point to the next):

- 2 WD..... 5
- 4 WD..... 4.5

Gear pump with a delivery rate of 35 l/min. at a 2200 RPM engine rate (see "Description of the Hydraulic Circuit").

Paper filter on the delivery side.

Balanced, double-acting steering cylinder mounted on the axle casing.

Max. working pressure in power steering system 170 +/- 5 bar (2465 +/- 75 psi)

Minimum turning radius (dimensions in mm).

MODEL	4 WD	
	w/o brakes	with brakes
125-135	5350	4600
145-165-185	5350	4600

4WD front axle

Front axle in spheroidal cast iron pivoting around two central supports.

Electro-hydraulic front drive engagement by means of "Spring-On - Pressure off" control system.

Propeller shaft without universal couplings installed along the longitudinal axis of the tractor.

Transmission through central differential and epicyclic final drives in the wheel hubs.

Max. steering angle 55°

Front axle with oil-cooled front brakes. The front brakes are the oil-cooled multi-disc type mounted on the live axles of the front differential: 4 discs (2 for each live axle).

Electro-hydraulically controlled "Twin-Lock" differential lock mounted as standard supply. Engagement occurs at the same time the rear differential is engaged. The differential lock is disengaged by means of the brake pedals.

Transmission unit on gearbox with reduction ratio 41/47

Mod. 125-135 - Central brakes

Bevel gear pair reduction ratio 13/36 = 2.769

Reduction ratio of epicyclic final drives 1 : 5.769

Total reduction ratio 15.974

Transmission ratio between front and rear axles 1.350

Mod. 145-165 - AG 155 CDH axles - Central brakes

Bevel gear pair reduction ratio 12/41 = 3.416

Reduction ratio of epicyclic final drives 1 : 5.077

Total reduction ratio 17.343

Transmission ratio between front and rear axles 1.339

Mod. 185 - AG 175 CDH axles - Central brakes

Bevel gear pair reduction ratio 9/26 = 2.899

Reduction ratio of epicyclic final drives 1 : 6

Total reduction ratio 17.334

Transmission ratio between front and rear axles 1.340

Refer to the dedicated chapter for the axle with independent suspensions mounted on request.

Technical specifications

Tyres

The following is a list of possible tyre types and front/rear combinations: consult your dealer for any queries you may have about these combinations.

For tractors with the overdrive function, only use tyres marked with the words "load index A8".

NOTE: Tractors are supplied by the manufacturer with tyres inflated at higher pressures than recommended. The pressure should be adjusted afterwards by the user according to values given in the tables of tyre manufacturers and to the use anticipated for the tractor

Tyre table for 2WD and 4WD tractors

Model		Front tyres		Rear tyres	
		Tyre	Rim	Tyre	Rim
125	4 WD	480/65 R 24 (127 A 8)	W 13-24	600/65 R 38 (147 A 8)	DW 18 L-38
		420/70 R 24 (130 A 8)	W 13-24	520/70 R 34 (148 A 8)	DWW 16-34 DL
		14.9 R 28 (128 A 8)	W12-28	18.4 R 38 (146 A 8)	DWW 15-38 DL
		380/70 R 28 (127 A 8)	W 12-28	480/70 R 38 (145 A 8)	DWW 15-38
		420/70 R 28 (133 A 8)	W 14 L-28	520/70 R 38 (150 A 8)	DWW 18 L-38
		480/65 R 28 (129 A 8)	W 14 L-28	600/65 R 38 (147 A 8)	DWW 18 L-38 DL
135	4 WD	14.9 R 28 (128 A 8)	W 12-28	18.4 R 38 (146 A 8)	DWW 15-38 DL
		380/70 R 28 (127 A 8)	W 12-28	480/70 R 38 (145 A 8)	DWW 15-38
		420/70 R 28 (133 A 8)	W 14 L-28	520/70 R 38 (150 A 8)	DW 18 L-38
		480/65 R 28 (129 A 8)	W 14 L-28	600/65 R 38 (147 A 8)	DW 18 L-38 DL
145	4 WD	14.9 R 28 (128 A 8)	W12-28	18.4 R 38 (146 A 8)	DWW 15-38 DL
		16.9 R 28 (136 A 8)	W 14 L-28	20.8 R 38 (153 A 8)	DW 18 L-38
		480/70 R 28 (140 A 8)	W 14 L-28	580/70 R 38 (155 A 8)	DWW 18 L-38
		480/65 R 28 (129 A 8)	W 14 L-28	600/65 R 38 (147 A 8)	DW 18 L-38
		420/70 R 28 (133 A 8)	W 14 L28	520/70 R 38 (150 A 8)	DW 18 L-38
		540/65 R 28 (137 A 8)	W14 L-28	650/65 R 38 (154 A 8)	DW 18 L-38
165	4 WD	14.9 R 28 (128 A 8)	W12-28	18.4 R 38 (146 A 8)	DWW 15-38 DL
		16.9 R 28 (136 A 8)	W 14 L-28	20.8 R 38 (153 A 8)	DW 18 L-38
		480/65 R 28 (129 A 8)	W 14 L-28	600/65 R 38 (147 A 8)	WW18L - 38
		480/70 R 28 (140 A 8)	W 14 L-28	580/70 R 38 (155 A 8)	DWW 18 L-38
		540/65 R 28 (137 A 8)	W 14 L-28	650/70 R 38 (154 A 8)	DW 18 L-38 DL
		540/65 R 28 (137 A 8)	W 14 L-28	600/65 R 42 (154 A 8)	DWW 18L-42
185	4 WD	14.9 R 28 (128 A 8)	W12-28	18.4 R 38 (146 A 8)	DWW 15-38 DL
		540/65 R 28 (137 A 8)	W 14 L-28	600/65 R 42 (154 A 8)	DWW 18 L-42
		540/65 R 28 (137 A 8)	W 14 L-28	650/65 R 38 (147 A 8)	DW 18 L-38 DL
		16.9 R 28 (136 A 8)	W 14 L-28	20.8 R 38 (153 A 8)	DWW 18 L-38 DL
		480/70 R 28 (140 A 8)	W 14 L-28	580/70 R 38 (155 A 8)	DWW 18 L-38

Technical specifications

Hydraulic circuit

Two-stage hydraulic gear pump powered directly by the gears of the timing system with double 40 micron paper filter on the intake.

The two pump stages supply:

1st stage: Delivery 35 l/min at a 2200 RPM engine rate. 20 micron paper filter on the delivery.

- Supplies:
- The power steering circuit, max. operating pressure 170 +/- 5 bar.
 - The 17-18 bar low pressure circuit including Powersix*, the four-wheel drive*, the hydraulic Power Take-Off*, the hydraulic brake of the Power Take-Off*, the differential lock.
 - (* Top only)
 - **Top-Tronic** circuit
 - The oil cooling circuit, max. pressure 5 bar.
 - The lubricating circuit of the gearbox and Powersix (or **Top-Tronic**), max. pressure 1.5 bar.

2nd stage: Delivery at a 2200 RPM engine rate

- Techno 125-135-145-165: 62 l/min
- 125-135 Top and **Top-Tronic**: 62 l/min
- 145-165-185 Top with mechanical lift: 62 l/min
- 145-165-185 Top and **Top-Tronic** with electronic lift: 79 l/min

- Supplies:
- The hydraulic trailer brake, max. operating pressure 130 +/- 10 bar.
 - The auxiliary control valves (max. 4), max. operating pressure 180 +/- 5 bar.
 - The hydraulic power lift, max. operating pressure 180 +/- 5 bar.

Electronically controlled power lift Top - Top-Tronic

Draft control, position control, "Intermix" combined draft and position control, and float mode.

Monitoring system Electronic

Type of control Electro-hydraulic

Electronic plant, sensors and electro-distributor BOSCH

Draft control by means of sensors mounted on the lower links (2 sensors) of the three-point linkage.

Operating voltage rating 12 Volt

Mechanically controlled power lift Techno

Draft control, position control, "Intermix" combined draft and position control, and float mode.

Three point linkage

Class 2 three point linkage with side stabilizers to limit implement swing.

Adjuster crank on RH vertical link rod. Optional hydraulic adjuster jack.

Adjuster crank of LH link rod with two positions at the lower end: one fixed and the other sliding.

Lower links have interchangeable Class 2 and 3 ball ends and quick hitch mechanisms.

Top link with rapid hitch mechanism, optional hydraulic adjuster jack.

Three point linkage powered by two single-acting hydraulic cylinders:

Mod. 125-135-145 diameter 90 mm

Mod. 165-185 diameter 100 mm

Rated lifting capacity at ends of lower links:

Mod. 125-135-145 minimum 6500 Kg
maximum 7000 Kg

Mod. 165-185 minimum 7600 Kg
maximum 8400 Kg

Technical specifications

Auxiliary control valves

Open center auxiliary control valves with rapid "Push-Pull" attachments.

Available versions:

- Standard single or double-acting control valve.
- Convertible single or double-acting control valve with automatic coupling.
- Convertible single or double-acting control valve with float position.
- Special control valve for hydraulic motors.

The auxiliary control valves use the power lift pump, thus the max. operating pressure is 180 bar (2610 psi).

Techno-Top: 3 auxiliary control valves are standard. On request, a control valve can be mounted provided with two hydraulic selectors controlling top link and leveling ram of the three-point linkage.

Top-Tronic: Five auxiliary control valves are standard. One control valve is provided with two hydraulic selectors controlling top link and leveling ram of the three-point linkage.

Flow divider on request: A maximum of three auxiliary control valves with flow regulator to control the oil flow to each auxiliary control valve.

Towing devices

Front pull hook.

Class "C" rigid rear tow hook adjustable in height: 4 positions.

Class "D3" rigid rear tow hook adjustable in height: 4 positions (available on request).

Class "C" or "D3" rear tow hook with quick height adjustment (7 positions) (available on request).

Class "A" rear swinging towbar (optional, in place of the Class "C" or "D3" tow hook).

Cab

Cab and platform tested to OECD international standards.

Noise level complies with EEC standards.

Platform completely supported on Silent Block dampers and cab in pressed structural steel with isothermal blue-tinted glass panes.

Heating, ventilating and air-conditioning systems.

Openable roof with wide visibility in an upward direction.

Seat

Standard padded seat with adjustable suspension.

The seat is also adjustable for height and distance from controls.

A seat with pneumatic suspensions, adjustable in the same way as the previous one, is available on request for maximum comfort.

Bonnet

Robust single piece pressed sheet bonnet. It can be tilted forward.

The side panels can be opened for full access to the battery, air filter and main engine components.

Technical specifications

Electrical system

Voltage: 12 V negative earth.

Battery

"Maintenance Free" type. Complies with SAE J537 regulations.

Specifications:

Voltage 12 V

Alternator

Type 55 Amp/h

Automatic voltage regulator incorporated.

Speeds without creeper

■ Underdrive: 18 speeds (6x3) reduced by 20% from 1.5 to 34 Kph

Remote charge indicator with light.

Starter motor

Continuous power 2.9 kW (4 HP).

Automatic pinion engagement by means of electro-magnet.

Lights

Front lights including:

- Two double filament headlights, 45/50 W.
- Two side lights (5 W bulb) with white glass.
- Two direction indicators (21 W bulb) with orange glass.
- Two direction-adjustable halogen field lights, 55W (max. four lights).

Rear lights including:

- Two tail lights (5 W bulb) with red glass.
- Two direction indicators (21W bulb) with orange glass.
- Two brake lights (21W bulb) with red glass.
- Registration plate light (5W bulb).
- Two adjustable rear field lights (55W halogen bulb) (max. four lights).
- 7-pin rear power socket for trailer lights.

Fuses

Consult the description in the "Electrical system" chapter for the fuses that protect the electrical system.

Technical specifications

Optional extras

- Towing device.
 - Front pull hook.
 - Class "A" rear swinging drawbar.
 - Class "C" or "D3" adjustable height rear tow hook.
 - Class "C" or "D3" rear tow hook with quick height adjustment.
- Up to four open center auxiliary control valves with hydraulic hoses and "Push-Pull" couplings. Available in various versions.
- Hydraulic trailer braking system available in two versions: one version for the Italian market and the other for the Export market.
- Pneumatic trailer braking system.
- 540ECO RPM PTO as an alternative to the 1000 RPM PTO.
- PTO proportional to the ground speed of the tractor to operate self-propelled trailers (on request and depending on the market).
- 1 3/8" (34.9 mm) diameter PTO shaft with 6 splines.
- 1 3/4" (44.4 mm) diameter PTO shaft with 6 splines.
- 1 3/8" (34.9 mm) diameter PTO shaft with 21 splines.
- Front-wheel ballast.
- Rear-wheel ballast (2, 4, 6 cast iron rings weighing 85 Kg each) (187 lbs): total weight 170-340-510 Kg (375-749-1124 lbs).
- Luxury seat with pneumatic suspension, adjustable as to height and distance from controls Top and Top-Tronic).
- Front fenders (depending on the market).
- Creeper range for very low gears with reduction ratio of 1 : 5.357 that reduces all the gears in the Speedsix gearbox by 80%, providing 36 forward gears and 36 reverse gears.
- Powersix (Top only): Electro-hydraulically engaged reduction unit with 1.2037 reduction ratio allowing all the gears of the basic gearbox to be reduced by 20% and providing:
 - Mounted with the basic Speedsix gearbox only: 36 forward speeds and 36 reverse speeds.
 - Mounted with the Speedsix gearbox and Creeper: 72 forward speeds and 72 reverse speeds.
- Top-Tronic gearbox: Electro-hydraulic engagement of three speed ranges plus electro-hydraulic reverse shuttle, available in two versions:
 - 1- Top-Tronic + basic gearbox: 54 forward speeds and 18 reverse speeds.
 - 2- Top-Tronic + basic gearbox + Creeper: 108 forward speeds and 36 reverse speeds.
- Three-point linkage with hydraulic RH levelling ram and hydraulic top link.

Suspended axle

Axle with hydropneumatic suspensions with central brakes

Mod. 125 - 135 Mounted on request.

Mod. 145-165-185 Mounted on request.

The front axle can be adjusted by the operator according to the work to be done (transport or field work). The adjustments are made by means of the control buttons (Fig.6-2).

Locked suspension

Press the switch (1) into the OFF position to have a rigid axle.

The forecarriage front of the tractor is lowered to the minimum height above the ground and remains fixed in this position.

Axle with free suspensions

This mode is to be selected for transfers and transport on roads.

- 1 - Press the 1-AUTO button for 2 seconds. The suspension goes down to the minimum height.
Wait 5 seconds: the axle automatically goes to the intermediate position for a maximum travel of 90 mm (-45mm down, +45mm up).

This position allows the forecarriage to swing. When the auto level is activated, the light in the AUTO button is always on.

When the suspension on the contrary is in the locked (rigid axle) or manual mode, the light is off.

Forecarriage height adjustment

Press the button (2) MAN as indicated by the arrow to adjust the height of the forecarriage above the ground. Adjust the height above the ground by means of the buttons A - B.

- Depress the button A to reduce the height above the ground.
- Depress the button B to increase the height above the ground.

Operation

- When the engine is switched off, at the next start the suspended axle is again automatically positioned in the last position by the control unit.
When the tractor is started, the control unit automatically selects the OFF mode with rigid axle, unless in the meantime a command is given to adjust the suspensions.
- At speeds under 20 km/h, with the MAN control the operator can adjust the forecarriage position or select the auto-levelling mode.
- At speeds over 20 km/h, the auto-levelling mode engages automatically and cannot be excluded.

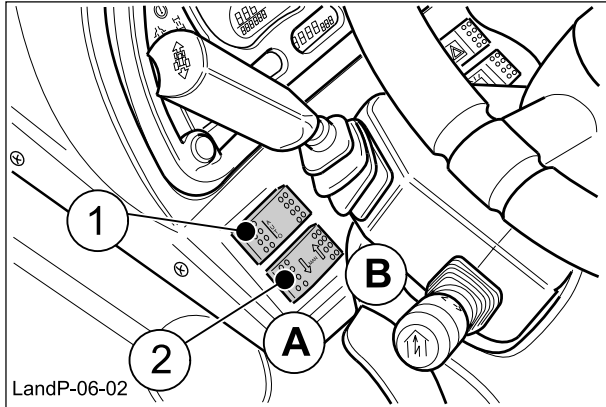


Fig. 6-2

- 1 - Two-position switch to select the operation mode
Pos OFF Axle with rigid suspension.
Pos AUTO Press AUTO once.
Axle with free suspensions automatically adjusted by the control unit in the intermediate position.

When adjusting in the AUTO positions, the system requires a few moments to actually perform the adjustments.

- 2 - Manual switch to adjust the height above the ground of the forecarriage (A and B).
A - To increase the height
B - To decrease the height



Suspended axle

Specifications

The four-wheel drive with independent suspensions has the same measurements of the rigid axle.

Mod. 125-135 - Central Brakes

Bevel gear pair reduction ratio 13-36=2.769
Reduction ratio of epicyclic final drives 1:5.769
Total reduction ratio 15.974
Transmission ratio front/rear axles 1.350

Mod. 145-165 - Central brakes

Bevel gear pair reduction ratio 12/41 = 3.416
Reduction ratio of epicyclic final drives 1 : 5.077
Total reduction ratio 17.343
Transmission ratio between front and rear
axles 1.339

Mod. 185 - Central brakes

Bevel gear pair reduction ratio 9/26 = 2.899
Reduction ratio of epicyclic final drives 1 : 6
Total reduction ratio 17.334
Transmission ratio between front and rear
axles 1.340

Electro-hydraulically controlled diff lock at the same time as the rear lock.

Oil-cooled multi-disc front brakes mounted in the axle shafts: 2 discs on each side (tot. 4), resin-graphite friction material.

Hydraulic control simultaneous to the rear brakes.

Oil type

Final drives, each

Oil specification: AGROLUBE KRIPTOS 80W90; SAE 80W 90EP has higher specifications than API GL4-GL5 e MIL-L-2105 and MIL-L-2105D.

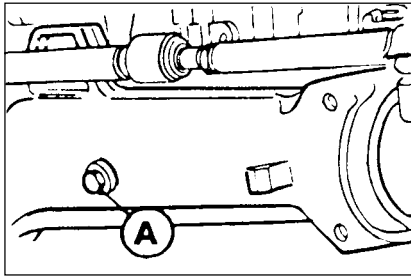
Central differential housing

Oil specifications: SINCROS/B, according to Landini specifications, that allow use of noise-reducing, antisquawk additives.

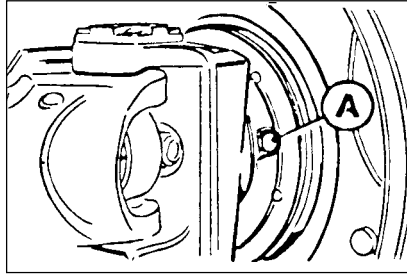
The use of different types of oil, or mixing other types of oil into the oil supplied with the tractor by Landini can lead to increased noise.

Grease nipple, grease specification: AGROLUBE G.M.P. GREASE EP.

Suspended axle with central brakes maintenance VARIABLE MAINTENANCE

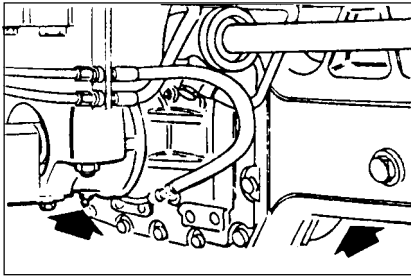


1 Front axle: Remove the plug (A) and check for oil level. e controllate il livello dell'olio. Fill up if necessary.

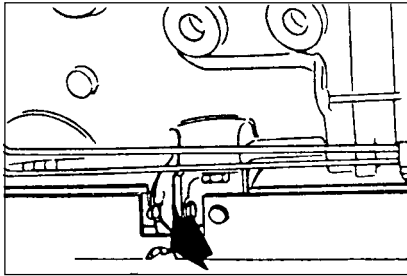


2 Front axle epicyclic final drives: Remove the plug (A) and check for oil level (the plug has to be placed on the horizontal center line of the wheel). Fill up if necessary through the plug.

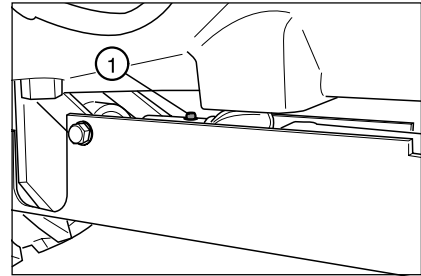
100 HOURS



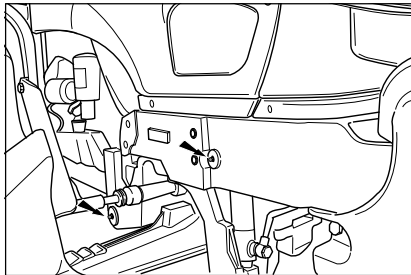
3 Two-wheel drive axle bushings: Inject grease of the prescribed type (2 nipples).



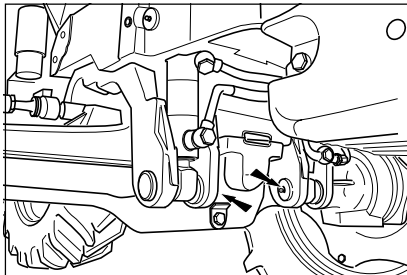
4 2WD drive shaft bearing: Inject grease of the prescribed type.



5 Universal joint lubrication (1): Inject grease of the prescribed type.

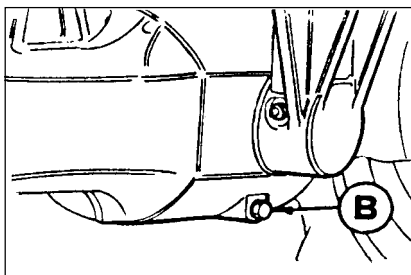


6 Cradle support and top pins grease nipples: Inject grease of the prescribed type.

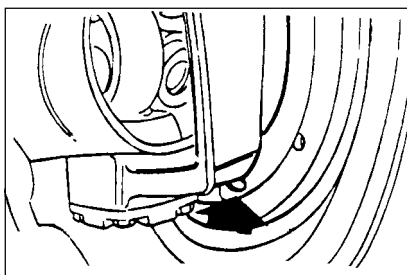


7 Cylinder supporting lower pins: Inject grease of the prescribed type.

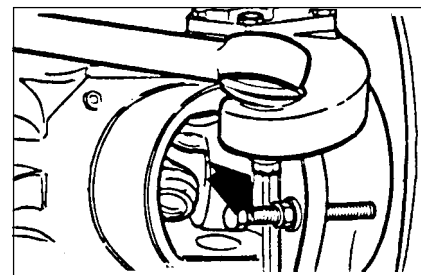
1000 HOURS



8 Front differential housing: Remove the plug (B) and drain all oil. Fill up again with oil of the prescribed type to the level of the plug (A) (see op. 10).



9 Front axle epicyclic final drives: Remove the plug (A) and drain all oil. Fill up again with oil of the prescribed type (see op. 11).



10 Knuckle joints of the steering cylinder: The nuts of the knuckle joints must be tightened by an authorized workshop after the first 50 hours service, then every 1000 hours.

Technical specifications

Noise levels

The following tables give the noise level values, measured from the driver's seat in instantaneous conditions in compliance with standards EEC 77/311 (dBA) - Annex II (without load) - and when driving in compliance with standard EEC 74/151 (dBA).

Tractors with cab				
Model	Test report numbers EEC 74/150	Noise level at driver's seat EEC 77/311 - dBA		Noise level on driving by EEC 74/151 dBA
		Closed doors	Open windows + rear doors	
125 TDI	e13* 0030* 05	77	80	83
135 TDI	e13* 0030* 05	77	80	84
145 TDI	e13* 0030* 05	76	81	83
145 TDI Dual power	e13* 0030* 05	76	81	83
165 TDI	e13* 0030* 05	76	81	83
165 TDI Dual power	e13* 0030* 05	76	81	83
185 TDI	e13* 0030* 05	77	82	85

Technical specifications

'EC' DECLARATION OF CONFORMITY

The EC code on the tractor approval plate solely indicates that the tractor in question conforms with directive 89/336/EEC and successive modifications and that it therefore complies with the essential requisites of the directive governing electromagnetic compatibility (Fig. 6-3).

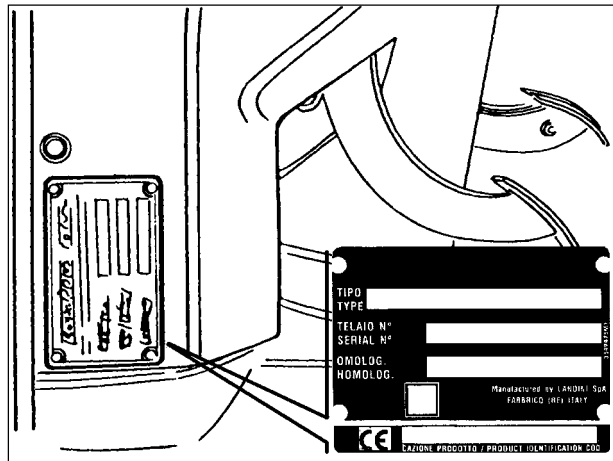


Fig. 6-3

Issue of Authorization

Requests for authorization to mount fixed implements for industrial or farming applications (loaders, snow ploughs, bush-cutters, etc.) oblige the manufacturer to inform the converter of all hitching conditions, maximum permissible loads on the axles and the hitch points that are to be used. The technical specifications to be observed when hitching farming or industrial implements are enclosed with the Operation and Maintenance Manual together with a drawing of the hitch points for implements and the application form. Both documents must be obtained from the manufacturer, filled in by the converter company and sent to the Sales Management for approval.

FOR ITALIAN MARKET ONLY

LANDINI S.p.A.

via Matteotti, 7 - 42042 FABBRICO (RE)
Tel. (0522) 656111 (10 lines) - Fax (0522) 660725
Landini Fabbri - Telex 530024

To

LANDINI S.p.A.

Via G. Matteotti, 7
42042 FABBRICO
(REGGIO EMILIA)

(date)

TECHNICAL SPECIFICATIONS FOR HITCHING FARMING OR INDUSTRIAL IMPLEMENTS

For Landini tractor (trade name)

serial number

- Support frames for the implement must be fitted using the hitch points on the tractor as shown in the enclosed drawings.
- The operations for mounting / re-mounting particular components of the tractor must be carried out according to Landini instructions as indicated in the Workshop manual and Servicing notes.
- Never bend, weld, or modify any part of the tractor's safety frame in any way.
- The tractor's safety frame has been registered under the O.E.C.D. code with an overall weight of 6500 Kg (14326 lbs).
- Loads that can be applied to the axles and tyres must never exceed the following amounts, as must be indicated in the Authorization:

DYNAMIC LOADS AT 40 Kph in ITALY ACCORDING TO TYRE TYPE	Model	Front load		Rear load		Total	
		Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
	125	2200	3450 3900	3600	5750 6300	5800	9200 10200
	135	2200	3450 3900	3600	5750 6300	5800	9200 10200
	145	2300	3450 3900	3650	5750 6400	5950	9200 10300
	165	2450	3500 4200	3800	5900 6700	6250	9400 10900
	185	2350	4300 4500	3900	7000	6250	11300 10500

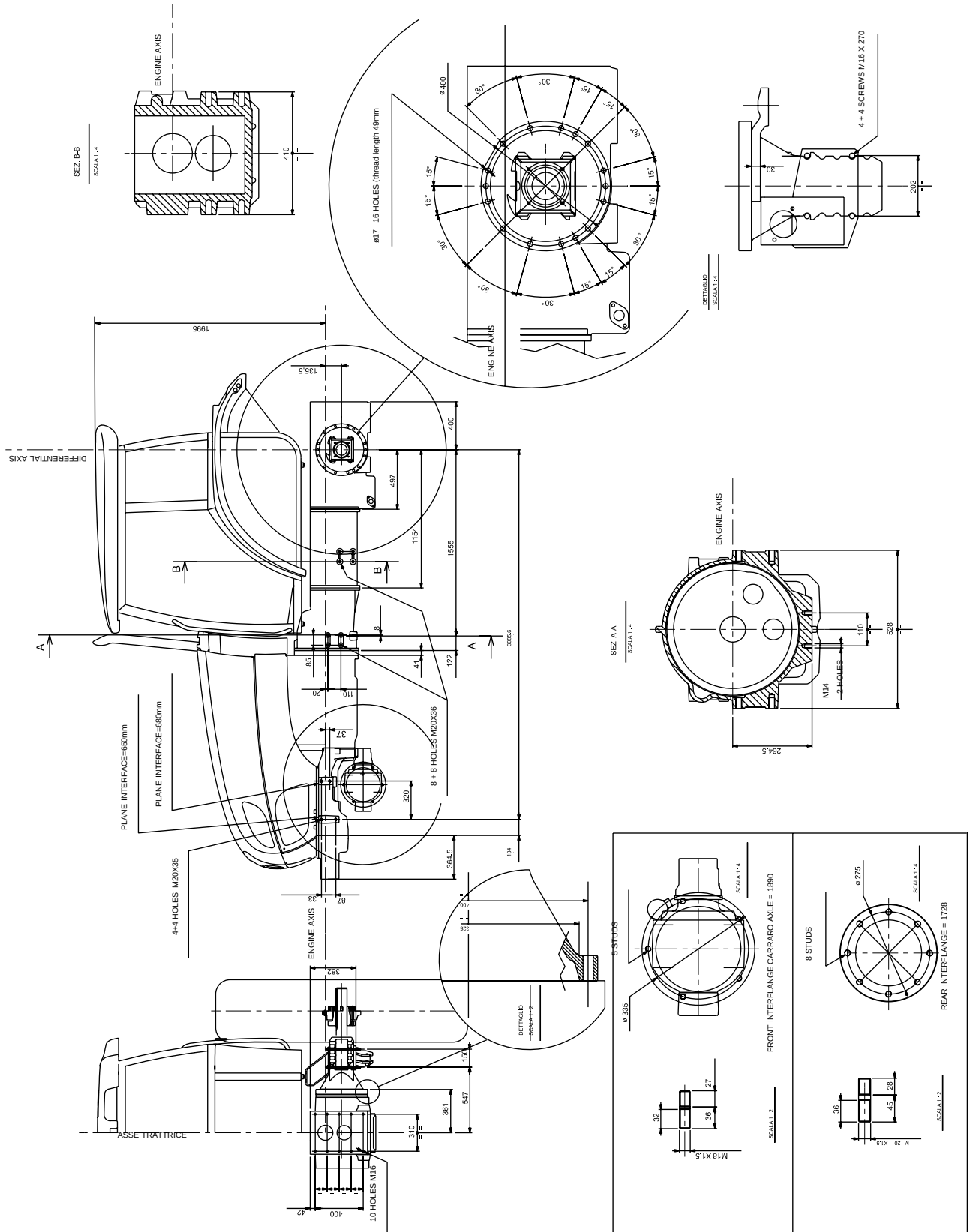
- The tractor's safety frame has been registered under the O.E.C.D. code with an overall weight of 3650 Kg, (8045 lbs) so the extra weight of the frames attached to the tractor must take this maximum limit into consideration.
- Loads can be applied to the axles and tyres must never exceed the following amounts, as must be indicated in the Authorization:
- Drawings of the implements and the hitching must be sent for inspection purposes only.
- The weight load on the axles must be such as to guarantee the stability of the tractor. It is a good principle for the load displaced to the ground via the front axle to be equal to at least 25% of the total original weight of the tractor.
- The general conditions of the tractor and, particularly, the state of maintenance of its axles, wheel assemblies, steering mechanism and brakes must be perfect and suited to the task.

Release of the Authorization is subject to acceptance of the above regulations. This letter is therefore to be signed by the converting company.

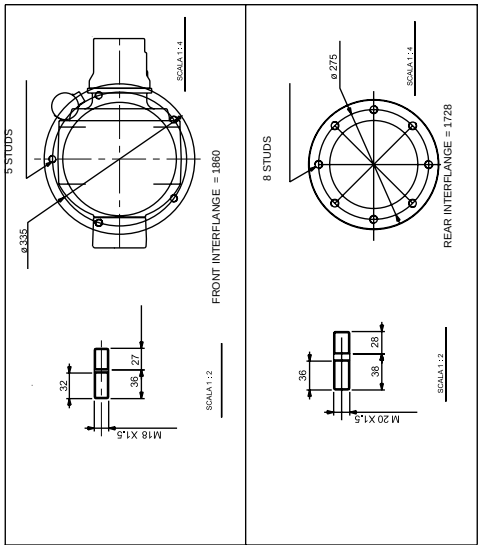
The Converter
(seen and accepted)

(Qualification and Development Manager)

DIAGRAM OF IMPLEMENT HITCHING POINTS LEGEND 145



187



INFORMATION CHART FOR AUTHORIZATION APPLICATIONS

MAKE:

TRACTOR CLASSIFICATION:

TYPE:

()

Adaptation of farm tractor

CHASSIS N°

()

Road-working machine

BASIC AUTHORIZATION N°

The following documents are enclosed:
weights per axle and total with implement/s
() Photostat copy of conformity certificate
() Photostat copy of log book

Initial set-up of the tractor at delivery:
max. speed

() Bi-directional drive

() Cab

() Fixed/folding safety frame with two uprights

() Safety frame with four uprights

() Front lift

() Power brakes for farm trailers

Pre-set ballast:

() at rear

Kg (lb)

projecting

() lateral

Kg (lb)

projecting

() at front

Kg (lb)

projecting

The tractor is currently equipped with the following tyres:

Front tyres

WEIGHTS WITH IMPLEMENTS HITCHED:

Rear tyres

Tare: Kg

HITCH POINTS:

Front:

N°

Bolts - meas.

on the front axle: Kg

Center:

N°

Bolts - meas.

on the rear axle: Kg

Rear:

N°

Bolts - meas.

HITCHED IMPLEMENTS

Make	Type	Position	Code	Alternative implements

ESCAPE CLAUSE

The undersigned with registered offices in

DECLARES

that he/she has attached the above mentioned implement in accordance with the highest professional and technical standards and, thus, that the undersigned accepts full responsibility for the conversion and correct set-up of the vehicle in compliance with the current regulations concerning road traffic, work safety and civil and penal responsibility.

The manufacturer is thus relieved of all and every responsibility for the correct operation of the vehicle, with reference to the afore-mentioned application.

DRAWING OF THE CONVERTED TRACTOR WITH OVERALL MEASUREMENTS

LUBRICANT AND FUEL CHART									
SYSTEM		Q.ty in litres				SPECIFICATIONS	AMBIENT TEMPERATURE	AGROLUBE	
		125 135	145	165	185				
COOLING SYSTEM		25	25	27	27	AGROLUBE MANTOS Antifreeze in the following percentages Ambient temperature Degrees °C -8° -15° -25° -35° Antifreeze percentage % 20 30 40 50			
FUEL TANK		260	260	260	260				
ENGINE WITH FILTER		16,6	16,6	16,6	16,6	—	BELOW 0 °C	—	
						—	0 °C TO 27 °C	—	
						API CE/SG CCMC D4	OVER 27 °C	KRONOS 30	
						API CH4 ACEA E5 MB 228.3	ANY TEMPERATURE	KRONOS LD 15W40	
SPEEDSIX GEARBOX - POWERSIX STEERING & HYDRAULIC CIRCUIT (1)		81	81	85	85	API GL 4 MF 1135	ANY TEMPERATURE	SINCROS/B	
TOP TRONIC GEARBOX - STEERING & HYDRAULIC CIRCUIT (2)		86	86	86	86	MF 1135-1141	ANY TEMPERATURE	SINCROS/C	
FRONT AXLE - CENTRAL BRAKES	AXLE	10	11	11	11.5	API GL 4 MF 1135	ANY TEMPERATURE	SINCROS/B	
	FINAL DRIVES*	1.6	1.8	1.8	1.9	API GL 5 MIL-2105 D	ANY TEMPERATURE	KRIPTOS 80W-90	
BRAKE CIRCUIT CLUTCH CIRCUIT		0.5 0.5	0.5 0.5	0.5 0.5	0.5 0.5	—	ANY TEMPERATURE	XERONS RED (3)	
GREASING NIPPLES		—	—	—	—	—	ANY TEMPERATURE	G.M.P. GREASE EP	

(1) Only use lubricants complying with LANDINI, NEW HOLLAND M2 C 86C, JOHN DEERE J 20C/D, M-F 1135 specifications. LANDINI specification provides additives and anti-noise, antisquawk, and antistick-slip properties. Use of different types of oil, or mixing other types of oil into the oil supplied with the tractor when new can lead to increased noise.

(2) Use ONLY SINCROS / C oil with transmission with Top-Tronic, ACCORDING TO LANDINI SPECIFICATIONS.

(3) Mineral based oil for brake circuits, according to LANDINI S/ENG/I 102 specifications.

* Each

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Landpower TDI Techno Turbo Diesel Intercooler 125TDI-135TDI-145TDI-165TDI

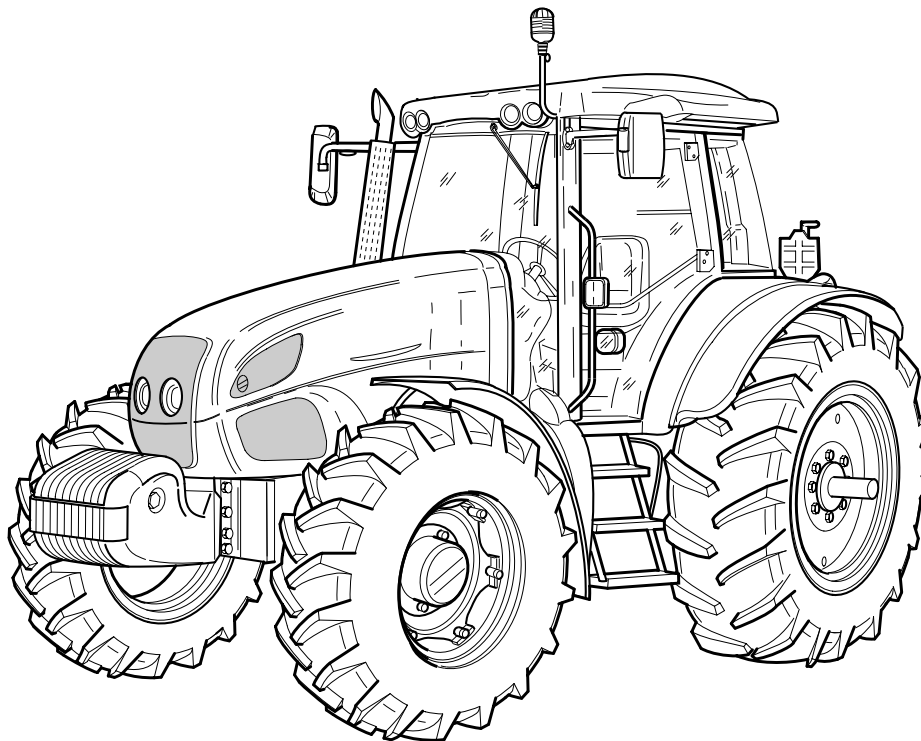


Fig. 7-1 - Landpower Techno 125TDI-135-TDI-145TDI-165TDI .

Landpower Techno TDI

		125TDI Techno	135TDI Techno	145TDI Techno	165TDI Techno
EURO2-TIER engine					
Perkins direct injection		1106C-E60TA	1106C-60TA	1106C-E60TA	1106C-E60TA
Fuelling system		Turbocharged	Turbocharged	Turbocharged	Turbocharged
ISO max power rating	HP/kW	117.6/86.5	134/98.5	145.5/107	163.2/120
Nominal rate	RPM	2200	2200	2200	2200
Maximum torque	Nm	487	555	604	641
Max. torque rate	RPM	1400	1400	1400	1400
Bore/ stroke	mm	100/127	100/127	100/127	100/127
Swept volume/N° cylinders	cc.	5989/6	5989/6	5989/6	5989/6
Water cooling		●	●	●	●
11" dry air filter		●	●	●	●
Fuel tank	liters	260	260	260	260
Clutch					
14"(355 mm) dry double-plate type		●	●	●	●
Cerametallic coating		●	●	●	●
Mechanical control		●	●	●	●
Transmission					
Speed six + creeper + reverse shuttle 36 FWD+36 REV		●	●	●	●
Synchronized mechanical reverse shuttle		●	●	●	●
Power take-off					
Lever operated mechanical control		●	●	●	●
2 speeds: 540/1000 RPM		●	●	●	●
Synchronized with the gearbox		●	●	●	●
1"3/8 PTO shaft with 21 splines		●	●	●	●
1"3/8 PTO shaft with 6 splines		○	○	○	○
4WD front axle					
Electro-hydraulic front drive engagement		●	●	●	●
55° maximum steering angle		●	●	●	●
Twin-Lock electrohydraulic diff lock		●	●	●	●
Brakes (Integral Braking System)					
Oil-cooled graphite rear brakes	N° plates	10	10	12	12
Oil-cooled graphite front brakes	N° plates	4	4	4	4
Hydrostatic control		●	●	●	●
Hydraulic trailer braking		○	○	○	○
Hydraulic power lift*					
Mechanical control		●	●	●	●
Draft, position control, intermix, floating functions		●	●	●	●
Lifting capacity with 90 mm *100 cyl.	mmkg	7000	7000	7000	8400*
Hydraulic pump flow rate	liters/min	62 + 35	62 + 35	62 + 35	62 + 35
2nd and 3rd class three-point hitch		●	●	●	●
Hydraulic adjustment of rh rod		○	○	○	○
SA/DA STD auxiliary control valves		3	3	3	3
Cab and driver's area					
Techno cab/pre-engineered for radio		●	●	●	●
Heating/ventilating		●	●	●	●
Air conditioning		●	●	●	●
Dimensions and weights					
STD front tyres		380/70R28	420/70R28	420/70R28	480/65R28
STD rear tyres		480/70R38	520/70R38	520/70R38	600/65R38
Cab height	mm	2780	2780	2800	2810
Wheelbase	mm	2800	2800	2800	2800
Max. length (with ballast)	mm	5130	5130	5130	5230
Ground clearance	mm	470	498	498	498
Total weight (without ballast)	kg	5600	5600	5800	6100
Wheels and tyres available on request					
Front		420/70R24	14,9R28	16,9R28	16,9R28
Rear		520/70R34	18,4R38	20,8R38	20,8R38
Front		-	-	480/70R28	480/70R28
Rear		18,4R38	-	580/70R38	580/70R38
Front		420/70R28	-	480/65R28	540/65R28
Rear		520/70R38	-	600/65R38	650/65R38
Front		-	480/65R28	540/65R28	540/65R28
Rear		-	600/65R38	650/65R38	600/65R42

Key: ● standard supply ○ optional # Only certain markets * Power estimated by manufacturer — Not available

Landpower Techno TDI

Instruments and controls - Mechanical lift and mechanical PTO (Fig. 7-2) Techno

NOTE: Consult the 'Operation' chapter for instructions on how to correctly use the controls.

- 1 Reverse shuttle lever.
- 2 Instrument panel.
- 3 Rotating beacon and hazard light switches.
- 4 Steering wheel height adjuster knob.
- 5 Brake pedals.
- 6 Accelerator pedal.
- 7 Speed selector lever.
- 8 Joystick (if fitted).
- 9 Range selector lever (Low - Standard - High).
- 10 Mechanical power lift controls.
- 11 Parking brake engagement lever.
- 12 PTO clutch engagement lever.
- 13 Light switch and horn.
- 14 Clutch pedal.

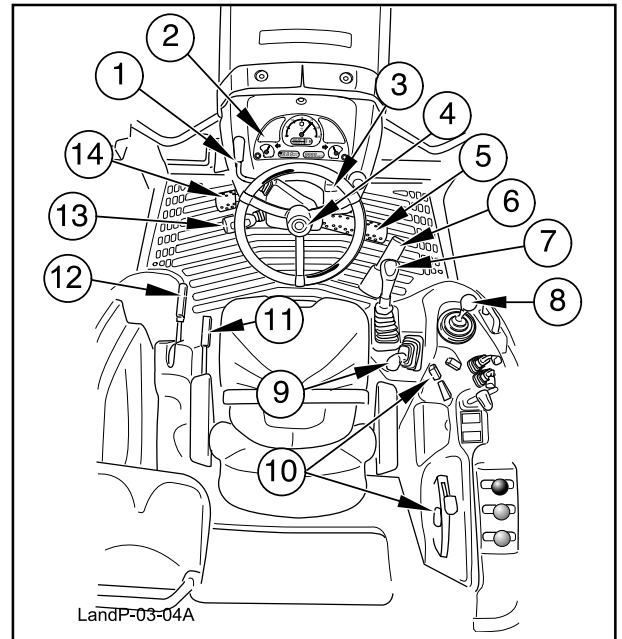


Fig.7-2 Techno TDI

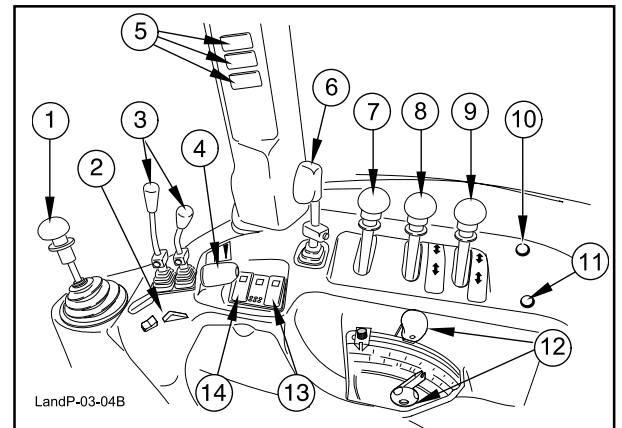


Fig.7-3 Techno TDI

Right-hand controls - Techno (Fig. 3-4)

- 1 Joystick (if fitted).
- 2 Up/down switch of mechanical power lift (on request)
- 3 Auxiliary control valve levers.
- 4 Hand throttle lever:
 - up: idling
 - down: full acceleration.
- 5 Cruise Control buttons (if fitted).
- 6 Auxiliary control valve lever and switch valve for hydraulic controls of three-point linkage (On request).
- 7 Creeper lever.
- 8 PTO mode selector lever (independent or proportional to ground speed).
- 9 PTO speed selector lever.

- 10 Auxiliary power socket.
- 11 Cigarette lighter
- 12 Up/down switch and mechanical power lift control panel.
- 13 Differential lock button.
- 14 4WD button.

Landpower Techno TDI

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*To ensure
long and efficient
service from your tractor
use only
original spare parts*

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